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THE NINTH YEARBOOK

OF THE

NATIONAL SOCIETY FOR THE STUDY
OF EDUCATION

PART I HEALTH AND EDUCATION

BY

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THIS YEARBOOK WILL BE DISCUSSED AT THE INDIANAPOLIS MEETING OF THE
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PREFACE

It is proposed in this *Yearbook* to consider briefly the different phases of educational administration, supervision, and instruction which have to do with health. Detailed and exhaustive treatment of the various topics enumerated under the several headings would fill several volumes.

The purpose then of this report is to present a synopsis of the field for the discussion of the Society and for the consideration of the teacher and general educator rather than the specialist in school hygiene or physical education.

Recognition is here given of assistance rendered in the preparation of this *Yearbook* by Dr. Edgar Fauver, Miss Caroline Crawford, Miss Mary Reesor, Miss Florence Healy, Miss Josephine Andrews, and Miss Jeanette Seibert.

INTRODUCTION

Health may be considered the keynote, the goal of effort, not only in school hygiene and sanitation, but in the entire physical education of the child, if the word health connotes not simply a normal state of the vegetative organism, but biologic soundness and completeness, present and potential, in respect to the racial as well as the social, industrial, and other obligations of the growing boy and girl. Health is the condition of the individual who is organically sound and who has the biologic basis for the attainment of completeness of body, completeness of mind, and completeness of character.

Health is not the end of life or education but it is an essential condition for the realization of worthy ends, more immediate or ultimate, in the career of the individual. The epigrammatic question may well be reiterated, "What shall it profit a child if he gain the whole world of knowledge and lose his health?" What may a child be allowed to accept, by those in any way responsible, in exchange for any actual or vital part of his health?

The people of this country are rapidly awakening to the appreciation of the national resources. The most important of all the nation's resources is the health of the people, and the most valuable asset in this capital of national vigor is the health of the children. It is the business of the nation to protect from harm at any cost the heirs of all the heritage of the past. During the schooling period the teachers become, as agents of the state, co-trustees with the parents in the great task of guarding, against injury or loss, those upon whom the entire future of the world depends.

Under the most favorable conditions the school is sure to be, in some respects an unhygienic and unsanitary place. Pupils are arbitrarily housed; deprived to a considerable and often serious extent, of fresh air and sunshine at an age when fresh air and sunshine are most important to them. They are confined to the schoolroom; compelled, oftentimes, to sit still and keep still when reasonable freedom of movement is absolutely necessary to self-expression and to balanced development. Scanty provision, if any, is made in most schools for the large activities of muscles and nerves which are as

essential in principle today as they ever were, for the development of the full complement of faculties which are needed for complete living.

The technical material of education, the elaborate processes of instruction, while intended for the welfare of the pupil, may be directly neglectful or subversive of the health interests of the individual child, if not of the majority.

Children are segregated in the schools from all parts of the community under conditions favorable for the collection and distribution of disease contagion at the age when they are most susceptible to such infection. The school then becomes an effective mechanism for the dissemination of disease infection. The most expert care can only partially reduce this danger.

Further, while under the present educational régime the pupil is taught many things, on the whole, and, in consideration of its relative importance, no subject is taught with less intelligence and skill, in more desultory and neglectful fashion than that which deals with health, and with the responsibility of the child in relation to health.

Finally, the very child, for whom the whole educational process exists, is often so handicapped by unrecognized physical defects as to diminish very materially, if not to nullify, the desired effects of educational effort.

If modern education is to fulfil in any worthy degree its complex of obligations to the child, to the home, and to society—in its relation to health—provision must be made in the school for the following phases of administration, supervision, and teaching:

I. The health condition of the pupil should be thoroughly investigated when he enters school and at intervals thereafter, indicated by the age and individual need of the child. Estimation should be made so far as may be possible of the pupil's capacity for biologic, mental, and moral development, so far as this is dependent upon physical condition and health status. The home should furnish information about personal history and habits of the pupil which may contribute to a better adjustment of the child's education and daily life at home or in school. Physical defects should be recognized and reported to the parents. If these defects are remediable the school should co-operate tactfully with the home for their care and

removal. The limitations, capacities, and tendencies of the individual should be understood as clearly as may be, and such knowledge should be utilized in every practicable way in the child's education. Daily and adequate inspection by teacher, nurse, and physician should insure all that is possible for control and prevention of infectious and contagious diseases.

II. The school environment should not only be free from deleterious influences but favorable in every material detail to the highest welfare of the pupil. All the features essential to the health of children—in the schoolhouse, its surroundings, construction, furnishings, and equipment—are within the power to provide, of practically every community in the country. The expense of the things which really affect the health of the pupil in school should be estimated in terms of child-life, child-health, child-efficiency, and only for convenience reduced to dollars and cents. The school should be made, and may be made, the most sanitary place in the community.

III. All the methods and materials of instruction, including the teacher even, should be wisely judged, selected, and adapted with partial and primary reference to their effect upon the health of the pupil. Nothing in modern education which is vital to the schooling of boys and girls need endanger, except through accident, the health and well-being of any pupil. The hygiene of instruction has received far too little attention.

IV. A dominant chord combining two main notes, in close harmony, should run through all the education of the child.

a) The teaching at every reasonable opportunity of the principles of healthful living as related to the individual, the home, and the community.

b) The inculcation in the pupil, by every practicable means, of hygienic habits, so that his conduct affecting himself and those about him may contribute to healthful and successful living.

V. Provision should be made in school for the physical training of the pupil. The child will engage in some of the desirable fundamental motor activities outside of the school in work or in play, at home or elsewhere. The improving curriculum requires progressively more of the large efforts of body and of the motor brain centers. It is the business of the school in physical education to

secure for the pupil that margin of neuro-muscular training, not otherwise provided, which is necessary to health and to the development of those mental, moral, and social qualities which are required for human efficiency in the large, and which are therefore necessary to complete and successful living.

HEALTH EXAMINATIONS

The health examinations of school children have two purposes:

I. To detect, at as early a stage as possible, cases of infectious and contagious disease, so that, by exclusion and isolation, the rest of the pupils and the community may be protected.

II. To discover physical defects and chronic ailments of importance, in order that the limitations of the pupil may be understood and that curable defects and disorders may receive appropriate attention.

If the state requires the unintermittent attendance at school of children from tender age onward for a period of six, seven or eight years, it incurs a large measure of direct responsibility for their physical welfare.¹

The day is nigh, perhaps, when the elementary school will have quite openly as its first great aim, the conquest of health and sanity for its children. The children are in many cases ill, and if not ailing themselves, are exposed every day to the risk of contact with disease and impurity. The new education discounts the results, however favorable on paper, of a system that ignores this. It recognizes that the creative power is within that gave us all we possess—that it reveals itself in the healthy, the growing, the vigorous, in whom the upward movement of life is not checked. In short, the new education is physiological.²

The investigation in school of the health condition of the pupil was undertaken at first for the purpose of detecting and isolating cases of contagious disease. In a few instances statistical studies were made to determine the effect of school life upon health. Comparatively early, investigations of eyesight were undertaken. Great credit is due to Dr. Cohn and others for thoroughgoing pioneer work in this field. Greater emphasis up to the present has been given, in the health examinations, to medical inspection for contagious and infectious diseases than to detection of chronic or permanent defects.

¹ Dawson, *German Workman*, p. 156.

² McMillan, *Labour and Childhood*.

Organized medical inspection was begun in various cities and countries as indicated below:

Brussels	1874	London	1891
Paris	1879	New York	1892
Antwerp	1882	Dresden	1893
Hungary	1887	Boston	1894
Moscow	1888	Wiesbaden	1896
Leipzig	1891	Japan	1896

In this country several types of state laws affecting medical inspection have been enacted:

- 1899. Connecticut passed a law requiring examinations of eyes in all schools.
- 1903. New Jersey passed a law permitting medical inspection in schools, authorizing the appointment of inspectors and outlining their duties.
- 1904. Vermont required by law examination of eyes, ears, and throats of school children.
- 1906. Massachusetts enacted a law making general medical inspection compulsory in all cities and towns.
- 1909. California enacted a law to "provide for health and development supervision in the public schools of the state of California." This is not a compulsory but a permissive law, intended to authorize boards of school trustees and boards of education to establish health and development supervision in all the public schools of the state. This is apparently the broadest and most comprehensive law relating to the school supervision of child-health which has been passed by any state.

Without state laws, the boards of health in New York, Utah, and California have provided for examinations of eyesight and hearing in the schools. Some form of medical inspection is in operation in about one hundred cities in the United States. At present there are between six and seven hundred regularly appointed school doctors in Germany. In the various forms of health examinations in European countries, much attention has been given to the investigation of physical defects. In the United States, up to the present time, outside of some half-dozen cities, little has been accomplished beyond the inspection for contagious diseases and rather desultory investigations of sight and hearing.

The most comprehensive and successful system of health examination and supervision is that of Wiesbaden. The Wiesbaden

system has become widely and favorably known and has been copied more or less fully by many cities not only in Germany, but in other countries.

About forty towns have adopted the Wiesbaden method *in toto*. In ten years one-fifth of all the German people have caused their children to be educated under the eyes of a school doctor. The whole movement seems to have united a great boldness with great confidence on the part of the people and of the school authorities. Though examinations are not compulsory, barely 4 per cent. of all parents have preferred to have children examined at home.

Information has not been flung away. In Leipzig three-fourths of the parents of delicate and diseased children act at once on advice offered. Only 3.5 per cent. neglect second warning. In Mülhausen and Berlin parents are invited to conferences of teachers and doctors.

To begin with, Wiesbaden not only respected the rights of parents; it began by taking them entirely into its confidence. A circular is sent out to every parent in the first year of every child's school life. It is really a long and confidential letter (very unlike the leaflets issued from time to time by some educational authorities). It runs as follows:

"For the better protection of the health of children attending the public schools, school doctors have been engaged to undertake the medical inspection of children on entering school, to be responsible for their health as long as they attend the school, and responsible, too, for the building itself from the point of view of the scholars' health.

"These provisions will be of great use both to the children and their parents. In the course of his education, much will be learned with regard to the health and bodily condition of each child, and this new knowledge, which is being gained now for the first time, the school doctors will put at the disposal of the parents with whom henceforth they will work in the interests of the children.

"Parents who, however, do not wish that their children should be examined by school doctors have a right to exempt them, as the new provisions do not refer to educational matters that are in any way compulsory. Such parents, however, must furnish the necessary information from their own doctor."

They would be strange parents who would "take offense" on receiving such a letter as this. With this letter is inclosed another, which requests, in case the examination is agreed to, the presence of the father, mother, or guardian.

The Wiesbaden school doctors make a further examination of children in the third year of their school life—yet another in the fifth year. Finally,

in the eighth and last year, just before the child leaves school, there is a final examination. The doctor has by this time the pupil's health card during school life before him. He has had opportunities of watching this pupil's progress and has the teachers' report to help him. Thus he is more or less in a position to give advice to the parents which should be of use to them in choosing the child's future trade or career in life. And to do this is his parting service to pupil and parent.

The weighing and measuring of children will be done by the class teachers. It is to be carried out half-yearly (measurement to half-centimetre and weight to one-quarter of a kilogramme). The doctor will measure regularly the chest girth of all children who are suspected of having lung disease or whose constitution and health are such that they are under medical control.

The health sheet and the weighing and measuring machines bring home to teachers the fact that the healthy children are passing rapidly through certain stages of growth, and that in the course of time, the contrast presented by them to the undernourished and undergrown gets more and more marked.³

Descriptions of certain aspects of the Wiesbaden system will illustrate important points:

Information furnished by parents whose children *are not* examined by the school doctors.

Name of child .....	.....
Born School .....	.....
General constitution .....	.....
Mental capacity .....	.....
Respiratory organs .....	.....
Spinal column and extremities.....	.....
Digestive organs .....	.....
Skin (parasites) .....	.....
Eyesight .....	.....
Ear—hearing .....	.....
Mouth, nose, and articulation .....	.....
Special remarks .....	.....
Medical recommendations regarding instruction .....	.....
Wiesbaden.....	.....

(Signature of doctor)

NOTE.—Doctors are requested to fill up the form as accurately as possible. The first column "General constitution" should be filled up, and that accord-

³ McMillan, *op. cit.*

ing to the categories "Good," "Medium," "Bad," with "Chlorosis," "Tuberculosis," etc., in parenthesis as the case may be. The other columns only when symptoms of disease exist. Details of the latter (in the column for "Special Remarks") are particularly desired when the child has been absent from school or receives special attention in instruction and gymnastics. This form must be filled up as often as may appear necessary.⁴

Notice sent to parents as a result of examination in Wiesbaden:

The medical examination (or supervision) ordered by the Magistracy of your child born has shown that it suffers from In the interest of your child's health and of the school it is urgently necessary that.....

(treatment recommended is here stated)

Weisbaden 190.....

The Magistracy

.....⁵ (Signed).....

MEDICAL REPORT ON LATE EXAMINATIONS (WIESBADEN)⁶

School..... Year..... Calendar Year.....
School Doctor.....

	1	2	3	1	2	3	1	2	3	Remarks
Class number and number of students.....										
General constitution { Good....										
{ Medium....										
{ Bad....										
Anaemia.....										
Scrofula (Tuberculosis).....										
Rickets.....										
Epilepsy and mental defects.....										
Chest and stomach.....										
Abdominal ruptures.....										
{ Lice.....										
Skin { Itch.....										
{ Other maladies										
Spinal column and extremities										
Eye maladies.....										
Defective sight.....										
Mouth and nose.....										
Defective articulation.....										
Under supervision.....										
Free from all ailment.....										

⁴ McMillan, *op. cit.*

⁵ *Ibid.*

⁶ *Ibid.*

A writer on industrial conditions in Germany comments further upon the value and effect of health supervision as related particularly to the attention given to chronic defects.

It might be thought that the attentions of the school doctors, though so well meaning, are regarded as inquisitorial and intrusive. Nevertheless, thanks to the discretion with which the school authorities and the school doctors go about their work, parental opposition has seldom to be encountered, and even initial prejudice is rare. Almost universally, parents welcome the school doctor's advice and help, and not merely facilitate the periodical examinations, but carry out faithfully the directions given. This is more noteworthy since in no German state do the education authorities possess legal powers to compel examinations or to inflict penalties in the case of refusal to undergo them. The whole system rests on a voluntary basis, yet it acts with remarkable efficiency, for tact and suasion have done what coercion would probably have failed to do. Parents are encouraged to regard the school doctors as friends whose only interest is their children's welfare, and the school doctors for their part take diligent care to cultivate confidence by enlisting the co-operation and the presence of the parents at every examination and all through their work as the guardians of the children's health. On the other hand, if a parent prefers that examination shall be made by the family doctor, no objection whatever is raised; all that is asked is that the same careful and exhaustive investigation shall take place, an investigation embracing the same questions and following the same principles, so that uniformity of procedure and of results may be secured, to which end special forms have to be used.

It is, of course, impossible to set forth the success of this system of school hygiene in the form of a bald set of figures, though figures may none the less be cited, eloquent and conclusive in their testimony to invaluable results. In the first place, young children are delayed from entering school whenever their physical or mental condition is such that school life, work and discipline would be harmful to them. In the second place, every detectable weakness of every child is dragged to light and carefully placed on record. Where medical treatment can be resorted to with hope of recovery, directions to that effect are given, and the school doctor, while he does not himself give professional attention, takes care that his advice is duly followed. Where, on the other hand, a child needs exceptional treatment in school the required attention is noted on the health certificate, and it is the duty of the teacher to see that it is faithfully observed. But the most important part of a school doctor's work is the detection of maladies and weaknesses which, but for his scrutiny, would probably have continued to evade the eye both of parents and teachers,

and might have been the source of permanent injury to the children concerned. To cite the case of Berlin: There school doctors were first employed in the year 1902, and of the children notified in that year for primary admission to school 12.3 per cent. had to be put back for varying terms. In 26 per cent. of the cases the reason was general physical weakness, in 16 per cent., delicate constitution, in 10 per cent., tuberculosis of the lungs. Last year (1905) the number of newly registered children examined was 34,562, and of these 2,927, or 8.5 per cent. were put back, while 7,041, or 23.7 per cent. were placed under oversight, making the total number under oversight in that year 24,225. The reason for oversight was defective sight in 22.4 per cent. of the cases, and general weakness in 13 per cent. The doctors' joint report for the year contained the significant remark, "Most of the children in the incipient stages of tuberculosis attend school without either parent or teacher having any suspicion that anything ails them." But at medical oversight in the narrower sense the more progressive towns do not stop, for here and there specialists are employed for the treatment of eye, ear, throat maladies, and in several towns systematic attention is also given to the teeth of all children in the elementary schools.⁷

Noteworthy features in the Wiesbaden system:

1. The means for securing the co-operation and sympathy of parents and teachers.
 2. The completeness of the examination.
 3. The frequency and regularity of the examination, coming at vital stages of the child's school life.
 4. The filing of the health report, a school record, used for reference in connection with the school work of the child.
 5. The scientific and educational interest of the doctors which insures thorough examinations and wins co-operation of teacher and parent.
 6. The popular nature of the movement as it has developed among the people and has not been imposed by a central government.
 7. The movement is an integral part of the school system and is treated primarily as an educational problem.
- Some of the practical, direct and indirect results of the Wiesbaden system may be stated thus:
1. Children of subnormal type are profitably delayed in entering school.
 2. Individual children are made happier and more efficient.

⁷ Dawson, *German Workman*.

3. Teachers are relieved by special individual adjustment of the weaker children.

4. To the movement can be traced:

a) The forming of special classes for defectives requiring modified treatment.

b) Installation of school baths.

c) Providing free meals for school children.

d) Establishment of free clinics and dispensaries for treatment of child ailments.

e) Founding of outdoor schools for weaker children.

The system is defended on economic grounds as an effective means of preserving and improving social and national efficiency. The spirit in which the personal supervision of the child's health in school should be conducted is well expressed in the following:

The new education is indeed more personal but it is more reverent and gentle than the old. Rudeness will wreck all. The human body is not vile. It is the instrument of instruments. The first condition of success is not that the doctor has degrees, it is that he should not offend one of these little ones. The behavior of children—that is not a thing to judge in the first place. To judge is easy, it has been done for ages, to understand is the new task begun very late. Hasty judgment precludes the possibility of complete understanding. To classify according to health is comparatively easy, it may be done by the three card system. To classify ability and weakness is not so easy. Each child presents his own problems.*

The statistics of infectious and contagious disease among school children vary greatly in different places. Infectious ailments like pediculosis (lice) and trachoma (granulation of eyelids) are very common among children of the crowded districts. They are comparably rare in families where children are relatively clean and well cared for. Board of health reports show that cases of measles, diphtheria, scarlet fever, and whooping-cough increase in number from the beginning of the school year in September when the housing-up and segregating process begins, up to March or April, when the children are more of the time out of doors. During the summer vacations the curves indicating the prevalence of contagious diseases are at the lowest. We are driven by such statistics to the conclusion that the school disseminates disease, and is responsible, in part at

* McMillan, *op. cit.*

least, for the greater prevalence of contagious diseases of children during the winter months. Extraordinary precautions based upon improving scientific methods will be necessary in order that the school may successfully safeguard the child from disease infection.

Regulations regarding exclusion from schools for infectious and contagious diseases and ailments are not uniform. Quotations from reports of various cities show confusing variety in procedure. The following suggestions are based upon experience in health inspection of school children and upon observation of such practices in the United States and European countries.

It is advisable to exclude from school, pupils who have the following:

- | | | |
|--|--|---|
| 1. Small-pox | grades, as this may be early state of whooping-cough, before spasmodic cough develops) | 13. Coryza (running at the nose) in pupils of kindergarten or primary grades, as it is often a symptom of measles |
| 2. Scarlet fever | | 14. Pediculosis, ring-worm, scabies (itch), other skin infections (if treatment of these disorders is under supervision of a school nurse exclusion is not necessary) |
| 3. Diphtheria | | |
| 4. Tonsilitis | | |
| 5. Measles | | |
| 6. Chicken-pox | 11. Trachoma (granulation of eyelids), if there is discharge from eyes | |
| 7. Mumps | 12. Acute conjunctivitis (this is usually either ["pink eye"] infection of eye, or a symptom of measles) | |
| 8. Acute adenitis (sudden swelling of the glands of the neck, which may be infectious) | | |
| 9. Whooping-cough | | |
| 10. Persistent cough (in pupils of kindergarten and primary | | |

This aspect of the work of the school nurse is very important, as it permits children with these minor ailments to continue in school.

The following regulations have been used successfully for several years in a large city school:

Each pupil who has been absent from school for three or more consecutive days for any reason must obtain a written permit from the school physician before being readmitted to school.

EXCLUSION FROM SCHOOL

No child will be admitted until after the expiration of the period of infection, as follows:

Diphtheria and membranous croup.—From beginning of throat symptoms

until one week after laboratory culture shows the throat and nose⁹ free from diphtheria bacilli. Children who have been exposed to this disease may return to school ten days after date of exposure, or if the disease has broken out in the home, ten full days after change of residence.

Scarlet fever.—From earliest manifestations of illness until desquamation is completed. Not less than six weeks. The period of exclusion will be increased if catarrhal conditions persist. Children exposed to this disease may return to school two weeks from date of exposure, or if the disease has broken out in the home, fifteen days after change of residence.

Measles and German measles (Rubella).—Three weeks from onset of disease, or until catarrhal stage has passed and cough has entirely disappeared. Children exposed to this disease will not be permitted to return to school until ten full days after date of exposure, or if the disease has broken out in the home, ten days after change of residence.

Whooping-cough.—Ten weeks, or until thirty days after the last characteristic coughing spell.

Chicken-pox.—Two weeks, or until desquamation is completed. If the disease has broken out in the home the child may return to school after change of residence.

Mumps.—Exclusion from school until seven days after swelling has entirely disappeared.

Modification of these rules may be desirable for high-school and college students.

In exclusion of pupils from school for contagious disease, wisdom dictates that the child shall stay away longer than is necessary after recovery rather than to endanger his school companions by returning too soon. The benefit of the doubt should be given to the many rather than to the one.

The limitation of contagious disease among children involves many difficult problems. One of these relates to the "bacillus or germ carriers." It is now well established that a person who has had diphtheria, for example, and has made a complete recovery, may carry diphtheria germs in the throat or naso-pharynx for an indefinite period and may, while in good health after convalescence, convey the germs to other people with perhaps resulting diphtheria which may be of the most severe type. Such a person is a germ carrier, and a very dangerous individual to be at large.

It is even possible that a child who has never had diphtheria may

⁹ In some cases, cultures from the throat may be negative, while cultures taken from the nasal passages may show presence of diphtheria bacilli.

be a diphtheria germ carrier, and may cause diphtheria in other children. A certain very capable graduate nurse is at the present time a diphtheria carrier, and is debarred from nursing. An apparently healthy pupil or teacher may then be a germ carrier and dangerous to others for this reason. In a Minnesota town recently the new superintendent found that diphtheria had occurred annually for several years. Cultures were taken from throats of all the school children at the beginning of the school year. Eight healthy diphtheria bacillus carriers were found among the pupils. They were excluded from school, received proper attention, and diphtheria was for the time stamped out of that town. It is now known that germ carriers may convey the bacilli of typhoid, diphtheria, tuberculosis, tonsilitis, and perhaps pneumonia and other diseases. "Typhoid Mary" has never had typhoid, but as a domestic servant has conveyed typhoid to other people innocently yet most effectively. Twenty-six cases (with one death) of typhoid have been attributed to this woman. Another woman who had typhoid eighteen years ago has worked in a dairy and as an unconscious typhoid carrier has caused many cases and several epidemics of the disease. It is entirely probable that in the near future teachers and pupils will be examined to detect carriers of disease germs.

In the more efficient detection of incipient cases of contagious disease the school nurse has demonstrated the great value of this one phase of her work. It is practically impossible for the school doctor to inspect all the children each day or each week. The grade teacher is not qualified to note some of the finer indications of beginning disease. The school nurse, with her special training and by daily inspection of all pupils, bridges the gap in inspection between teacher and doctor, and may perform service of almost inestimable value. Dr. Cabot states that—

for ten years in Boston schools, the average number of cases of scarlet fever found each year under inspection of teachers and doctors was 14. In 1908 under inspection of school nurses 1,000 cases were found. That means that the nurses are nearly seventy times as good as the teachers in making the diagnosis of scarlet fever. Under so-called medical inspection (really teachers' inspection) 86 cases of measles was the average number found each year. The school nurses in 1908 found 2,285 cases, or about thirty times as many.

The more comprehensive examination of pupils for chronic weaknesses and defects in addition to detection of acute disease, is coming into vogue slowly. The most significant pronouncement concerning this wider scope of health investigations is contained in the *Memorandum on Medical Inspection of Children in Public Elementary Schools under the English Education Act of 1907*.

This new legislation aims . . . at the physical improvement and, as a natural corollary, the mental and moral improvement of coming generations. It is founded on a recognition of the close connection which exists between the physical and mental condition of the children and the whole process of education. It recognizes the importance of a satisfactory environment, physical and educational, and, by bringing into greater prominence the effect of environment upon the personality of the individual child, seeks to secure ultimately for every child, normal or defective, conditions of life compatible with that full and effective development of its organic functions, its special senses, and its mental powers which constitute a true education.

This memorandum also states that the work of medical inspection cannot be properly accomplished unless the teacher, the school nurse (where such exists) and the parents or guardians of the child co-operate heartily with the school medical officer.

A recent report from Tasmania shows a sudden development of thorough health examinations resulting from no traditional medical inspection. The work is under the Medical Branch of the Education Department in close co-operation with educational administration. Its object is stated—

To put children in the most suitable condition for receiving instruction.

Observation and special research show that a considerable percentage of the children in the schools are in such a condition of ill-health that their physical development is vastly more in need of special attention than their intellectual development.¹⁰

An inquiry concerning health examinations in schools was sent out within a year to all cities (136) in the United States having a population of 30,000 or more. Answers were received from 112 of these: 35 had no regular inspection; 10 had simply medical inspection for contagious diseases; 8 reported experimental and irregular inspections; 17 had periodic examinations for sight and

¹⁰ Burnham, *Pedagogical Seminary*, 1900, p. 92.

hearing only; 42 show evidence of systems of health examinations in varying degrees of development and completeness.

The cities having the best organized systems are: Boston, Chicago, Cleveland, Los Angeles, Milwaukee, New York, and Philadelphia.

Examinations in the following thirty-five cities include beyond inspection for contagious disease other items than sight and hearing:

Akron,	Fall River	Memphis	San Antonio
Baltimore	Fitchburg	Newark	Schenectady
Birmingham	Harrisburg	New Orleans	Springfield (Ohio)
Brockton	Hartford	Newton	Superior
Buffalo	Haverhill	Norfolk	Syracuse
Camden	Houston	Paterson	Trenton
Cincinnati	Indianapolis	Portland (Ore.)	Utica
Detroit	Lancaster	Reading	Waterbury. ¹¹
Elizabeth	Little Rock	Rochester	

Physical defects among school children have been found in varying proportions.

Dr. Hertel, in his well-known investigation of the health of pupils in the better-class schools of Copenhagen before 1885, found that of the boys 31.1 per cent. and of the girls 39.4 per cent. were sickly.

Dr. Francis Warner in the examination of 50,000 school children in London found that 10.8 per cent. of the boys and 8.5 per cent. of girls had abnormal nerve signs; 7.9 per cent. of boys and 6.9 per cent. of girls were mentally dull; 8.8 per cent. of boys and 6.8 per cent. of girls had had some developmental defects. Of the cases with developmental defects, 38.4 per cent. of the boys and 49.9 per cent. of the girls were mentally dull. Of those who were mentally dull, 57.6 per cent. of the boys and 52.6 per cent. of the girls showed abnormal nerve signs.

Dr. Risely examined the eyes of 2,422 school children in Philadelphia and found that 44.7 per cent. had some deficiency of vision.

Dr. Sexton examined 570 school children in New York City and found that 13.3 per cent. had deficient hearing in one or both ears. "Of these only one was known by the teacher to be defective, and only ten knew themselves to be deficient in this sense."

Examinations of 40,000 school children by school physicians in the Duchy of Saxe-Meiningen, Germany, in 1900, showed that 23 per cent.

¹¹ Some other cities from which reports were not received should, perhaps, be added to this list.

were myopic, 10 per cent. or more had spinal curvature, and 60 per cent. had teeth which needed attention.

Examinations of 900 pupils in the Horace Mann Schools of Teachers College, New York City, during 1902-03 showed that 34 per cent. had myopia, 12.9 per cent. had functional heart disorders, 5.6 per cent. had spinal curvature with some vertebral rotation, 31.2 per cent. more had asymmetry of spine, hips, or shoulders, 14.6 per cent. had adenoids or chronically enlarged tonsils.¹²

STATISTICS OF DEFECTIVE HEARING AMONG SCHOOL CHILDREN

	No. Examined	No. Defective	Percentage
United States.....	57,072	2,067	3.6
Russia (Zhermunksi's report).....	2,221	388	17.42
Stuttgart (Weil's report).....	5,095	1,528	30.00
Bordeaux (Moure's report)	3,588	616	17.00
Copenhagen (Schieneglow's report).....	581	290	50.00
London (Dr. Cheatle's report).....	1,000	568	56.8
Edinburgh.....	567	211	35.24
Aberdeen.....	600	87	13.00

Moure claims that 500 out of 616 could have been cured of their deafness if properly treated.

The teachers after the tests selected 70 children whom they considered backward; 51 of these children were dull of hearing.

The following table shows the number of defects found in boys of Truant School No. 120, Brooklyn, N. Y.:

No. examined.....	88	No. cases deformity of extremities	2
No. found defective.....	77	No. cases defective nasal breathing	17
No. cases anterior glands.....	62	No. cases bad mentality.....	9
No. cases bad teeth.....	34	No. cases skin disease.....	13
No. cases defective vision.....	48	No. cases cardiac disease.....	3
No. cases hypertrophied tonsils.....	19	No. cases defective hearing.....	1
No. cases post nasal growth.....	8	No. cases defective palate.....	1

Examinations of school children in Minneapolis in 1908 showed:

	Percentage		Percentage
Malnutrition	23.3	Defective hearing	7.7
Enlarged cervical glands.....	53	Defective teeth	43.5
Heart disease	2.1	Enlarged tonsils	31.1
Lung disease	4.2	Adenoids	12.6
Defective vision	23.9	Treatment necessary	65.1

One writer states that in Germany 90 per cent. of all elementary-school children suffer from decayed teeth. Condition of children's

¹² "School Hygiene," *Teachers College Record*, March, 1905.

teeth is not much better, if at all, in this country, and statistics show further that the teeth of country children are as bad as those of city children, while native-born American children show about the same percentage of decayed and neglected teeth as those of foreign birth. A school physician of Ashley, Mass., reports that 95 per cent. of the school pupils have decayed teeth. A school physician at Northampton, Mass., states: "The most deplorable fact from the examination, was the almost total lack of care given children's teeth. Out of 600 children only 74 had received any attention and the larger number of the remaining 526 exhibited most uncleanly and unhealthy mouths." Examination of 572 children of Foxboro, Mass., showed 1,303 teeth which needed to be filled and 334 which required extraction.

SHARE OF THE TEACHER IN HEALTH INSPECTION

In district schools and in schools of small communities which are not visited daily by a doctor, and in large schools where a nurse is not employed, the teacher has the responsibility for detecting at least the signs of acute disease. She should be able to test eyesight and hearing, and it is desirable further that she should note as far as may be possible the indications of important chronic defects.

The following directions are taken from the admirable handbook on *Medical Inspection* issued by the Massachusetts Board of Education.

SOME GENERAL SYMPTOMS OF DISEASE IN CHILDREN WHICH TEACHERS SHOULD NOTICE; AND ON ACCOUNT OF WHICH THE CHILDREN SHOULD BE REFERRED TO THE SCHOOL PHYSICIAN

Emaciation.—This is a manifestation of many chronic diseases, and may point especially to tuberculosis.

Pallor.—Pallor usually indicates anaemia. Pallor in young girls usually means chlorosis—a form of anaemia peculiar to girls at about the age of puberty. It is usually associated with shortness of breath; the general condition otherwise appears good. Pallor may also be a manifestation of disease of the kidneys; this is almost invariably the case if it is associated with puffiness of the face.

Puffiness of the face.—This, especially if it is about the eyes, points to disease of the kidneys; it may, however, merely indicate nasal obstruction.

Shortness of breath.—Shortness of breath usually indicates disease of the heart or lungs. If it is associated with blueness, the trouble is usually

in the heart. If it is associated with cough, the trouble is more likely to be in the lungs.

Swellings in the neck.—These may be due to mumps or enlargement of the glands. The swelling of mumps comes on acutely, and is located just in front of and below the ear. Swollen glands are situated lower in the neck, or about the angle of the jaw. They may come on either acutely or slowly. If acutely, they mean some acute condition in the throat. If slowly, they are most often tubercular. They may also be the result of irritation of the scalp, or of lice in the hair.

General lassitude and other evidences of sickness.—This hardly needs description, but may, of course, mean the presence or onset of any of the acute diseases.

Flushing of the face.—This very often means fever, and on this account should be reported.

Eruptions of any sort.—All eruptions should be called to the attention of the physician. It is especially important to notice eruptions, because they may be the manifestations of some of the contagious diseases. The eruption of scarlet fever is of a bright scarlet color and usually appears first on the neck and chest, spreading thence to the face. There is often a pale ring about the mouth in scarlet fever, which is very characteristic. There is usually a sore throat in connection with the eruption. The eruption of measles is a rose or purplish red, and is in blotches about the size of a pea. It appears first on the face, and is usually associated with running of the nose and eyes. The eruption of chicken-pox appears first as small red pimples, which quickly become small blisters.

A cold in the head, with running eyes.—This should be noticed, because it may indicate the onset of measles.

Irritating discharge from the nose.—A thin, watery nasal discharge, which irritates the nostrils and the upper lip, should always be regarded with suspicion. It may mean nothing more than a cold in the head, but not infrequently indicates diphtheria.

Evidences of sore throat.—Evidences of sore throat, such as swelling of the neck and difficulty in swallowing are of importance. They may mean nothing but tonsilitis, but not infrequently are manifestations of diphtheria or scarlet fever.

Coughs.—It is very important to notice whether children are coughing or not, and what is the character of the cough. In most cases, of course, the cough merely means a simple cold or slight bronchitis. A spasmodic cough, that is, a cough which occurs in paroxysms and is uncontrollable very frequently indicates whooping-cough. A croupy cough, that is, a cough which is harsh and ringing, may indicate the disease, diphtheria. A painful

cough may indicate disease of the lungs, especially pleurisy or pneumonia. A long-continued cough may mean tuberculosis of the lungs.

Vomiting.—Vomiting usually, of course, merely means some digestive upset. It may, however, be the initial symptom of many of the acute diseases, and is therefore of considerable importance.

Frequent requests to go out.—Teachers are too much inclined to think that frequent requests to go out merely indicate restlessness or perversity. They often, however, indicate trouble of some sort, which may be in the bowels, kidneys or bladder; therefore, they should always be reported to the physician.

Eye signs which should be noted by the teacher have been tabulated conveniently thus:

- a) All those with "sore eyes"—the name commonly given to chronically or acutely inflamed eyelids.
- b) All those with styes.
- c) All those whose eyes are congested and "red" where they should be blue-milk-white.
- d) All those that squint, either constantly or occasionally.
- e) All those that hold their reading-books nearer to the face than one foot.
- f) All those that hold their books at arm's length in order to read.
- g) All those that cannot read blackboard writing freely from their seats.
- h) All those that "peer" like a cat in the sun, or shut their eyelids to a chink.
- i) All those that have a drawn, anxious look when reading from map, or blackboard, or wall card.
- j) All those that slope the head to read.
- k) All those that complain of headaches or show very small pupils at the end of the day.
- l) All backward children showing one or more of these symptoms.
- m) All that fear the light.

DIRECTIONS FOR TESTING EYESIGHT

CONDITIONS FOR TEST

I. Make the test for each pupil singly and in a room apart from the schoolroom if possible.

II. For children too young to read, use the chart with pictures of familiar objects.

ARRANGEMENT OF CHART

III. Hang the Snellen test chart away from windows, in a good light, on a level with the head.

TEST

IV. Place the pupil 20 feet from the chart. Hold a card over one eye firmly against the nose without pressing on the covered eye. Have pupil name letters from the top (larger letters) downward, reading from left to right with one eye and from right to left with the other to avoid reading from memory.

RECORDING

V. The lines on the chart are numbered. At a distance of 20 feet the normal eye should read the letters on the 20-foot line.

Record would be $\frac{20}{20}$ { distance in feet of chart from the eye
 } number over the line of smallest letters read.

If the smallest letters which can be read are on the 30-foot line, vision will be recorded as $\frac{20}{30}$. If smallest letters which can be read are on the 40-foot line, the record would be $\frac{20}{40}$. If pupils cannot see the largest letters numbered, for instance 100, have him approach slowly until he can read them. If 10 feet is the greatest distance at which largest letters can be read, record would be $\frac{10}{10}$. A mistake of two letters on the 20-foot line and of one on the 30- or 40-foot line may be allowed.

REFERRING PUPILS

VI. If the child has less than normal vision; if the eyes are persistently red and inflamed; if there is pain in eyes or head after reading, notice should be sent to the home that medical attention is needed.

DIRECTIONS FOR TESTING HEARING

THE EXAMINER

I. To insure more uniformity in tests, one person, if possible, should make all the tests in a school. This person should have normal hearing and conduct the tests in such a way that the children have no fear.

PLACE FOR TEST

II. The tests should be made in a quiet room not less than 25 to 30 feet long. The floor should be marked with parallel lines one foot apart.

TEST

III. The test should be made with the whispered voice, which should be heard by the normal ear at 25 feet. The child should repeat what he hears, and the distance at which words can be heard distinctly should be recorded. Each ear should be tested separately with the eyes closed, and the other ear should be tightly closed with the finger during the test.

RECORDING

Hearing may be recorded by a fraction:

Numerator $\frac{20}{25}$ { distance in feet at which whisper is distinctly heard
Denominator } distance at which whisper should be heard by normal ear.

WATCH-TICK TEST

If hearing is defective, it may be tested by a watch-tick and the distance recorded in inches—in same manner—at which watch is heard. The tick in different watches varies, but it should be heard at a distance of 3 to 5 feet.

GROUP TEST

A rough, but sometimes useful whisper test of hearing may be given to a number of children sitting approximately in a row with eyes closed at a distance of 25 feet from the teacher, but the group test will never be so accurate as the individual test.

The teacher with little practice may examine children's teeth.

The teacher also should observe signs indicative of nervous and mental conditions of children:

NERVE SIGNS

a) Restlessness, inability to stand or sit quietly in a child formerly self-controlled; rapid twitching movements of head, face, body, arms, hands, or legs—these are frequently early and slight symptoms of chorea (St. Vitus' Dance).

b) Slower movements and twitchings, sometimes habit spasms which may be due to eye strain, adenoids, or other abnormal conditions.

c) Faintings, or moments when lips turn blue and child seems unconscious of what is going on about him. These may be the lesser seizures of true epilepsy.

d) Irritability, excessive fears, morbidness, crying fits, undue sensitiveness may indicate neurasthenic condition (chronic fatigue).

WORK OF THE SCHOOL NURSE

The well-trained nurse is becoming a most important factor in the care and supervision of health of school children. Her service to child-life and to education has passed beyond the experimental stage.

About one hundred and fifty school nurses are employed in New York City at a salary for each of \$75 a month. School nurses are also employed in Boston, Philadelphia, and several other large cities. The functions of the school nurse may briefly be summarized as follows:

1. Daily inspection of pupils in school. With training they may become more expert than the school doctors, even, in the detection of early symptoms of scarlet fever, measles, diphtheria, chicken-pox, and mumps.

2. Treatment of minor injuries and direction of treatment of such conditions as pediculosis, ringworm, scabies, and conjunctivitis (not trachoma)

3. Visitation of homes (outside of school hours) to instruct parents about treatment ordered by the doctor and to give suggestions about matters relating to the home care of child, and home sanitation in general. The nurse may give practical demonstrations of brushing the teeth, treatment of pediculosis, the giving of a bath. The services which the qualified nurse may perform are too extensive and varied to enumerate and impossible to estimate in value.

PHYSICAL DEFECTS IN SCHOOL CHILDREN

The examination of pupils for chronic defects when the child enters school, and annually or biennially afterward, may profitably involve the following items:

1. Age	charge	tions, curvature)
2. Height	9. Throat (tonsils, adenoids)	17. Abdominal walls (for hernia)
3. Weight	10. Teeth	18. Feet (condition of arches)
4. Chest measurements (in special cases)	11. Cervical glands	19. Nervous and mental development (precocious, retarded)
5. Eyes (condition of conjunctiva)	12. Skin	20. Stage of development in adolescence
6. Vision	13. Bones (with reference to rickets)	
7. Hearing	14. Heart	
8. Nose (concerning mouth breathing) and catarrhal nasal dis-	15. Lungs	
	16. Spine (posture, deviations, shoulder posi-	

As part of the investigation of the general health condition of the pupil, information about family, personal health history, and about home habits may be of great value.

Such requests for information will in many cases call attention to factors in the home life of the child which may have an important bearing upon the health of the pupil and upon his school life.

A blank to be filled out by the parents may serve thus as a valuable link between home and school and contribute to more effective co-operation between parents and teachers in the interests of the child, not only in relation to physical but mental and moral welfare. Such a home blank has been used for several years in the Horace Mann School in New York City with excellent results. The blank given below for illustration is similar to the one referred to above, and suggests the details of information which may be found.

HEALTH BLANK TO BE FILLED BY PARENTS

Date

Name in full

Name and address of parent or guardian.....
.....

Date of birth..... Place of birth.....

How many older brothers?..... Older sisters.....

How many younger brothers?..... Younger sisters.....

Health of child since birth.....

Health of child now: Excellent, good, fair, poor.....

Name diseases or injuries that child has had, and note permanent effects
of such upon health.....
.....

What weaknesses or tendencies to ill-health exist?.....
.....

Which of these tendencies are hereditary?.....
.....

Average number of hours in bed.....

Is sleep sound or restless?.....

Is child refreshed and cheerfully ready for the day's tasks?.....

Is appetite good, medium, or poor?.....

What does the child eat for breakfast?.....

Number of hours out of doors daily.....

Favorite out-of-door exercises or games.....

Does child prefer outdoor play, or reading for recreation?.....

Average time for home study, if any.....

Conditions for home study: Artificial light and arrangement, number of
people in room, noise and confusion.....

Studies or lessons taken out of school and number of hours a week given
to each

Habit of bowels.....

Dates of successful vaccinations.....

Date of last attempt at vaccination.....

General remarks

Weight is an important indication of the health condition of the child. The pupil should be weighed every year, and in case of acute illness or other health disturbances, at more frequent intervals. If the child is materially below the standard weight for age and height, medical care should be given. If the weight is greatly above the standard, medical care may also be needed.

Weight increases with height and age in normal children. A child who is short in stature for his age is apt to be under weight. This will help to explain how the mean weight of boys sixteen years old and 60 inches high (90 lbs.) is less than the mean weight of boys fifteen years old and 60 inches high (95 lbs.). Similarly, children very tall in relation to age are in some cases lighter than children of the same height but one year younger. The heights and weights of these tables were taken without clothing. Weight of clothing ranges from about 3 pounds in five-year-old children to 6 or 7

RELATIVE WEIGHT AND HEIGHT TABLE—BOYS

The figures represent weight in pounds

RELATIVE WEIGHT AND HEIGHT TABLE—GIRLS

The figures represent weight in pounds

Height in inches	5 Yrs.	6 Yrs.	7 Yrs.	8 Yrs.	9 Yrs.	10 Yrs.	11 Yrs.	12 Yrs.	13 Yrs.	14 Yrs.	15 Yrs.	16 Yrs.	17 Yrs.	18 Yrs.	19 Yrs.	20 Yrs.
30	34															
40	37	35														
41	38	37														
42	41	39	39													
43	41	41	42													
44	45	43	44	42												
45		45	45	45												
46		48	47	47												
47			50	49	49											
48				51	51											
49					53	53	54									
50					56	56	57									
51						59	58	60								
52						63	62	62	63							
53							64	63	66	65						
54							69	68	69	68						
55								70	71	73						
56								75	75	76	78					
57									78	80	83					
58									83	86	88	89				
59									88	89	93	97	100			
60									94	94	96	100	104	109	103	99
61										99	100	102	100	109	106	105
62										104	104	106	111	110	107	111
63											107	109	116	110	112	113
64											112	118	116	117	114	110
65											114	118	121	125	120	123

pounds in older pupils, and is slightly greater for boys' than for girls' clothing.

The foregoing tables give in whole number of pounds the weights of boys and girls of different ages and different heights. The method of using the table will be readily apparent, e. g., the mean (corresponding closely to the average) weight of a boy twelve years old and 58 inches tall is 84 pounds.

Possible injurious effects of the more important physical defects of children may be classified as follows:

I. *Defective eyes with imperfect vision*

- a) Headache commonly through forehead or back of head, or both.
- b) Blurring of sight, but, in hypermetropia with eye strain, vision may be exceptionally good, especially for distant objects.
- c) Nausea and dizziness, sometimes disturbances of digestion with resulting malnutrition.

- d) Nervous exhaustion with neurasthenia.
- e) Nervous irritability and lack of nervous control shown in muscular twitching of face, arms, and legs.
- f) Mental inability to grasp an idea presented through the eyes.
- g) Retardation in school.
- h) In rare cases convulsions.

Some medical authorities have attributed epileptic and epileptiform seizures to abnormal eyes.

II. *Defective ears*

- a) With catarrh of middle ear—danger of mastoid disease.
- b) With deficient hearing, pupil is often dull, careless, listless, inattentive, and mentally backward.
- c) Retardation in school.
- d) Pupils are often considered mentally defective when the only primary defect is imperfect hearing.

III. *Adenoids*

These are growths of lymphoid tissue (somewhat similar to enlarged tonsils) in the naso-pharynx, up behind the soft palate, and not usually visible on inspection of throat without a laryngoscopic mirror. The causes of adenoid enlargement are not clearly understood. They seem to belong to civilization. Some primitive races are free from them and possibly all.

- a) Structural effects.
 - 1. High-arched palate.
 - 2. Narrowing of upper jaw.
 - 3. Deformity of chest, resulting from obstructed and imperfect breathing, shown by lateral depression of front of chest and prominent sternum (breast bone).
 - 4. Disturbed development of teeth and vocal organs.
 - 5. Accompanied by large tonsils in one-third of cases.
- b) Functional disturbances.
 - i. Mental.
 - (a) Disturbances in function of brain resulting in aprosechia nasalis—i. e., difficult for patient to form an idea of anything new; is stupid, has difficulty in retaining ideas, weakness of memory, inability to turn his thought upon a definite subject, lack of power of attention. Guys found among 152 patients with adenoids 62 with decided aprosechia, 32 with slight degree, and 58 with none.
 - (b) Irritability, depression, and often disorderly conduct.

2. Deafness. This is present in a large percentage of all well-marked cases and is due to blocking of Eustachian tubes. Freudenthal found 467 cases of deafness in his 1,000 cases.
 3. Defects in sense of smell and taste.
 4. Defects in voice (nasal voice).
 5. Chronic rhino-pharyngeal catarrh shown by a persistent nasal discharge. This is often one of the first symptoms. In very young it is manifested by snuffles.
 6. Obstruction of air passage resulting in breathing disturbances, manifested by open mouth, great restlessness at night, the child being forced to assume various attitudes, i.e., sleeping on face, etc., in order to breathe better.
 7. Reflex.
 - a) Catarrhal spasm of larynx, or croup.
 - b) Headache.
 - c) Intractable cough and hoarseness.
 - d) Bronchial asthma.
 - e) Enuresis (incontinence of urine).
 - c) General effects.
 1. Malnutrition and anaemia.
 2. Underdevelopment, physical and mental.
 3. Predisposition to otitis media (middle ear disease) laryngitis, colds of a remittent nature; increased susceptibility to disease infections, such as tuberculosis, diphtheria, scarlet fever, etc.
- Description of appearance of a child with marked enlargement: mouth open, dull, sleepy, with inquiring look; upper lip short and thick; upper jaw narrowed; nasal orifices small and pinched; the face full under the eyes; listless and indisposed to physical or mental exertion; stupid and backward; in school from one to two years behind the normal pupil of same age; undersized.

IV. Enlarged tonsils

The tonsils are believed to have useful function in infancy and early childhood, but normally they decrease in size and almost disappear when the child is from five to seven years of age.

Enlarged tonsils produce many of the unfavorable results attributed to adenoids. The two conditions are often associated and it is difficult to distinguish between their effects. Enlarged tonsils produce susceptibility to

- a) Tonsilitis.
- b) Quinsy.

- c) Diphtheria.
- d) Rheumatism.
- e) Tuberculosis.
- f) Pneumonia, and perhaps other forms of infection.

The presence of enlarged tonsils and adenoids in school children should be known and when any disturbances of health can be attributed to them, these structures should be removed. Their absence is an unqualified advantage.

V. Defective teeth

"If I were asked to say whether more physical deterioration was produced by alcohol or by defective teeth, I should unhesitatingly say—defective teeth. In some schools as many as 98 per cent. of pupils show defective teeth. From 50 to 75 per cent. of all school children in this country need at this moment dental care."¹³

¹³ Osler, *London Lancet*, October 21, 1902.

a) Direct effects:

1. Pain of excruciating type resulting in great loss of time and rest.
2. Foul breath with unsightly and inflamed mouth.
3. Improper mastication of food.
4. Extension of decay in sound teeth.
5. Decay of temporary teeth resulting in unsound and carious permanent teeth.
6. Infection of glands.
7. Infection of maxillary (jaw) bone.
8. Earache with otitis-media (middle ear disease) and deafness.
9. Headache.
10. Disturbance in function of eye.
11. Frequent digestive disturbance.

b) Indirect effects.

- I. Condition of poor nutrition and less resistance to disease.
2. Carious teeth form an almost perfect culture bed for growth of pathogenic bacteria. This fact with lowered resistance leads to increased frequency of infection with pneumonia, diphtheria, etc.
3. Results which accompany defective hearing.
4. Lowering of vitality and temporary or permanent ill health.

There are twenty dental clinics in New York City where teeth are extracted or filled either free or at a very moderate charge, but this number is entirely inadequate to the needs of the population.

- VI. *The condition of the skin* is an important indication of the general tone and health condition of the body.
- VII. *Rickets* produces softening of the bones with different degrees of deformity, and indicates malnutrition which may injure other tissues of the body including the brain.
- VIII. *Abnormal conditions of the heart*, even if temporary, may disturb health and if neglected may result in permanent weakness of the heart itself or of the body in general. The condition of the heart is always an important index of the health condition and is often a valuable guide in adjusting amount of sleep, arrangement of school programme, and selection of muscular exercise which is most suitable for the pupil.
- IX. *The lungs* are important as a favorable location of tuberculous disease. Lung tuberculosis is more common among school children than has commonly been supposed. In pupils who are under weight, anaemic, lacking in vitality, even if not coughing, the lungs should be carefully watched.
- X. *Deviations of spine*, roundness of shoulders and stooping postures are common among boys and girls especially between ages of eleven and sixteen. Many children outgrow these conditions without special attention, but these asymmetries should be inspected from time to time to prevent as far as possible the more chronic defects in posture, and the occasional cases of genuine scoliosis (curvature of the spine) which begin so insidiously.
- XI. *Abdominal hernia* (rupture) involves serious and often dangerous weakness of the abdominal walls. It is important for the welfare of children, in the occasional cases which exist, that the condition should be detected and given appropriate treatment.
- XII. *Weak foot arches* may produce:
- Pain in the instep or sole of the foot, sometimes in the ankles, knee, or hip (discomfort in feet or legs, which may be called growing pains or rheumatic pains, is often due to flat foot). A child in good health does not have growing pains. Persistent "growing pains" should always be investigated and given intelligent care.
 - Disability, of some degree, in walking and standing, with stiff awkward gait as a result of the loss of springiness in the foot, even if discomfort does not diminish inclination to walk. Unhygienic shoes; walking and standing with toes turned out; improper methods in the gymnasium in standing, marching, and

various forms of exercise—all these conditions help to weaken arches and flatten feet. It is important for many reasons that children should be able to stand, walk, and run easily and comfortably. There is a surprising proportion of school children today who have some degree of weakness of the feet, and whose general efficiency is thereby to some extent weakened. Pupils and parents should be instructed regarding hygienic shoes; and the material and methods of gymnastic instruction need some reconstruction for the prevention of flat and weak feet.

XIII. *Phimosis in boys* (curable by circumcision) may cause:

- a) Condition which makes cleanliness difficult or impossible, with danger of infection and inflammation, and other disturbances.
- b) Hernia and other injuries from straining in voiding urine.
- c) Local sensitiveness and irritation, which is one of the most frequent causes of masturbation (self-abuse).
- d) Reflex nervous irritation which may result in insomnia, night terrors, nocturnal incontinence of urine, constipation, indigestion, malnutrition, irritability of temper, wandering attention and nervous instability.
- e) In rare cases, even chorea (St. Vitus Dance) and hysterical manifestations.

XIV. *Nervous and mental states* in relation to healthful development need constant supervision. Precocity is often more serious from the health standpoint than the same degree of mental slowness. The precocious child should not be pushed in school, but rather held back. On the other hand, really backward children should be carefully studied and curable defects should be promptly corrected.

Recent studies by Ayres¹⁴ indicate that children tend to outgrow certain defects with advancing age (though not so uniformly as to justify neglect of these) and that physical defects are only in moderate proportion of cases the prime cause of retardation in school. It is always important, however, to examine the backward child with scrutinizing care for physical defects which may, to some extent at least, cause retardation.

XV. *The progress of organic as well as mental and moral development* should ever be considered in relation to age; but the pupil should be judged and adjusted on an individual basis, with reference to his present and future welfare so far as may be advisable, independently of age or type.

¹⁴ L. P. Ayres, *Laggards in Our Schools*.

COST OF HEALTH SUPERVISION IN SCHOOLS

The expense of health supervision in the schools varies according to the extent of work done and the compensation given. The annual cost ranges per capita up to \$1.50.

The general and thorough health supervision costs much more than the limited medical inspection for contagious disease. There is no recognized standard for payment of medical inspectors. Dr. Osler has said in relation to the work of medical inspection in England: "If we are to have school inspection, let us have good men to do the work and let us pay them well. It will demand a special training and a careful technique." The medical inspectors in England are on the average much better paid than in this country.

No expense of education is more thoroughly justified than the money paid for honest and effective health supervision.

ADMINISTRATION OF HEALTH SUPERVISION

Health inspection has had its beginning, with few exceptions, in the medical inspection for contagious disease, administered by the Board of Health. When the broader work of health examination and care has grown out of this, or up about it, the Board of Health usually has had the doctor and the organization to carry on the work more conveniently and economically than the educational authorities. While the inspection for contagious disease will always remain a vital factor in health inspection in schools and must be controlled or sanctioned by the Board of Health, the large work of health examination and care in schools is primarily and essentially an educational interest and task. It must finally, logically, and inevitably be controlled and directed by the educational authorities, but in co-operation with the local health authorities (so far as control of contagious disease is concerned). The exercise of authority in the schools, in relation to all aspects of health inspection, by the Board of Health is not, and cannot be, satisfactory to the community. Dual control by the Board of Health and Board of Education has proved confusing and ineffective.

The tendency in the future will undoubtedly be to unify in the schools the various health interests under the direction of a supervisor of health, or a director of hygiene and physical education.

LEGAL CONTROL

It is probable that in the near future there will be recognition by the law of the right of the state, in the schools, to re-

quire an accurate knowledge of the health condition of school children.

The right of education further to compel by law, if need be, the correction of important defects, will probably be supported by suitable statute. It is vitally important, however, that every other resource for guarding the physical welfare of children should be utilized before the law is invoked, even if the required treatment for the child suffers at times much delay.

There are many reasons why the control of the home over these basic physical conditions of the child should suffer no more interference than seems absolutely necessary. The sympathetic mutual interest in child health, of home and school, offers the most natural introduction to a closer co-operation between teacher and parent which is greatly to be desired and which may affect favorably not only the physical, but the mental and moral life of the pupil and the home.

It is significant that the Wiesbaden system, even under the paternal and autocratic government of Germany, should have achieved its signal success on the principle of educational suasion and without the assistance of coercive measures.

In the physical care of the child by the state through the providing of free lunches, free spectacles, etc., there is greater danger of pauperizing the home than by provisions made for the intellectual or moral needs. If, however, the home cannot, or will not, provide for the serious physical or health needs of the child, there is convincing support for the argument that society should supply such needs, or compel the home by law to give requisite care, rather than allow the child to suffer damaging neglect, "for a weak or a sickly body is a grievous moral disability in so far as by narrowing the range of contact with life it stunts the character."¹⁵

The state cannot afford on economic grounds even, to educate a child who is handicapped by removable obstacles or whose personality or character is being distorted in any preventable manner.

Finally, for the efficient care of the health of school children, it seems necessary that superintendents, teachers, and parents, as well as the school doctors and special teachers in this field, should be educated in the essentials of child hygiene.

¹⁵ MacCunn, *The Making of Character*, p. 55.

SCHOOL SANITATION

School sanitation has to do with making the material environment of the school favorable to the pupils' health. The school building should be the most sanitary structure in the community.

In the past, cathedral, town hall, government buildings, public library, building of college or university, have represented in public buildings the civic pride of the community. To as great a degree, if not a greater, the schoolhouse in country or city should be a model of architectural adaptation to use, and of sanitary excellence. This building for the training of the young may be made in any community, by intelligent planning and without unreasonable expense, a structure of genuine beauty and a source of continual safety, comfort, and pleasure.

The studies of the sanitary condition of schoolhouses made in many cities in Europe, and in this country in Boston, Philadelphia, Buffalo, and several other cities, show the existence of some schoolhouses that defy almost all the well-accepted principles of hygiene, and whose use for the purposes of instruction is a disgrace to civilized communities; and they indicate that however good the best schoolhouses in this country may be, a large part of them are unfit for use because of their unsanitary condition. These investigations have been made usually under the direction of competent experts. Among the evils found are insufficient light, lack of ventilation, air vitiated by odors from outhouses, old-style vaults, gases from the heating apparatus, etc., wraps and umbrellas kept in the schoolrooms, old-style furniture too large or too small for the children, seats placed at a plus distance, the arrangement such that the light comes from the right, practically no attempt at cleaning the rooms, dry sweeping, the use of a feather duster to stir up the dust, dirty textbooks, etc.

Intelligent citizens object to a law that requires children to attend school when so often the conditions are such that a child cannot stay in the schoolhouse without danger to health.¹

The chief considerations in school sanitation relate themselves to a few main essentials: (1) fresh, clean air; (2) sufficient light properly controlled; (3) cleanliness; (4) hygienic furniture;

¹ W. H. Burnham, "Health Inspection in the Schools," *Pedagogical Seminary*, Vol. VII.

(5) sanitary condition of materials used by the pupils (to prevent infection); (6) pure water supply; (7) disposal of sewage.

A schoolhouse without an adequate playground is an educational deformity and presents a gross injustice to childhood.

The location of the schoolhouse (with reasonable deference to the geographical center of the community) in anything but the most sanitary and desirable position available is altogether indefensible.

Neglect of anything essential for health in construction, materials, arrangement, and equipment of school building, in relation to the ordinary work of education, and in provision against accidental injuries to life (in fire protection) is a social and civic crime.

GOOD AIR

The importance of fresh, clean air can hardly be over-estimated. Outdoor air is the most valuable tonic known. Of the three life essentials—air, water, food—air is the cheapest and the most neglectfully used. Its very character, its universal diffusion, render it liable to a great range of contaminations. In fact, the different forms and varieties of contamination and vitiation to which air is liable are so subtle and complex that the scientists have not fathomed them all, nor devised forms of apparatus which are capable of measuring some of the important changes which occur. Ventilation is the most important feature in the sanitation of the school.

The evil effects of lack of ventilation are made only too evident by such facts as that the death-rates have been reduced by the introduction of efficient ventilating systems in children's hospitals from 50 to 5 per cent.; in surgical wards of general hospitals from 44 to 13 per cent.; in army hospitals from 23 to 6 per cent.; prison records show reduced death-rates chiefly as a result of effective ventilation, in one case from a yearly average of eighty deaths to one of eight, each period covering the same and a considerable number of years. The annual death-rate among horses in army stables in the German service has been reduced by more roomy quarters and free ventilation from 19 to 1.5 per cent.; and in Boston in time of epidemic the number of horses lost in badly ventilated stables was 5, to 1 in those well ventilated.

A vitiated atmosphere lowers the vitality, increases the susceptibility to, and severity of disease, and decreases the physical working power of the individual; while not producing sudden death, nevertheless, it inevitably shortens life.

One report of the New York Board of Health treating of the primary cause of disease, says "Forty per cent. of all deaths are caused by breathing impure air." Along this same line the Peck Williamson Company's treatise on ventilation quotes Dr. A. N. Bell as follows:

"The depressed state of the organism under the prevailing conditions of badly ventilated schoolrooms not only predisposes to epidemic diseases, but the liability to and the danger of all diseases are intensified, and the vicissitudes of weather, which under favorable circumstances may be encountered with impunity, under these depressing circumstances become dangerous perils; and doubtless much that is attributed to the season of the year supposed to be predisposing to scarlet fever, whooping-cough, diphtheria, and some other common affections of children, is due to the same cause."²

A chief educational reform of the future will be the ventilation of schoolrooms, with direct effect upon the intelligence, attention, and learning capacity of the scholars, quite apart from any question of physical health.³

Bad air is one predisposing cause of tuberculosis. Some of the census reports show that mortality from tuberculosis among teachers is 20 per cent. greater than the average among those in other occupations. Children are more sensitive than adults to the injurious effects of vitiated air as well as other unhealthful influences.

When air is bad, this is not under any ordinary circumstances due to increase of CO₂ (carbonic acid gas), nor to diminution of oxygen; nor (according to the latest and best authorities) is the injurious quality due to any intrinsic organic poison, exhaled from the lungs of a healthy person. In an occupied room the oxygen is diminished in the air and the carbon dioxide is increased, but before the oxygen decrease is serious, or the carbon dioxide is increased to an injurious degree, other changes make the air unfit for breathing.

Since the carbon dioxide in the air may rise to 4 or 5 per cent. and higher without exercising any harmful effects, we may conclude that the indisposition which results from long confinement in badly ventilated or overcrowded rooms is due, not to the influence of any poisonous constituents of the expired air, but to other circumstances—e. g. higher temperature, higher humidity, gaseous substances coming from the intestine

² S. H. Woodbridge.

³ Saleeby, *Health, Strength and Happiness*, p. 29.

or from an unclean skin, etc. It is assumed of course, that the ventilation is not so bad that carbon dioxide accumulates in too large quantities.*

The injurious conditions in "bad air" are:

- a) Excessive temperature
- b) Unusual humidity (air too moist or too dry)
- c) Exhalations and disease germs from unclean clothing and unclean and unhealthy human bodies
- d) Overheating of air (injured by being cooked)
- e) Dust from floor, blackboards, corners, crevices, moldings, etc. containing in addition to less harmful ingredients, disease germs
- f) Products of combustion from artificial light and from imperfect heating appliances
- g) Gases, dust, and bacteria from neighborhood (streets, factories, etc.)

a) The best temperature for the schoolroom is 68° Fahrenheit. If the temperature exceeds 70° there is depression of vitality and nervous tone, especially if the humidity is unusually high or low, as is often the case. German school authorities have found by experience that it is advisable to shorten school session or to dismiss pupils in warm weather if the temperature rises above 78-80° F.

There should be a thermometer in every schoolroom, and even if there is thermostat (automatic) control, or supervisory control by janitor or engineer, the teacher should keep a record on a temperature chart arranged for this purpose.

b) While the humidity (percentage of moisture in the air) may be excessive and depressing in warm spring or autumn days, the humidity is often too low, and consequently the air is too dry in cold weather in the schoolroom where the school is heated by furnace or steam. Favorable humidity is 40-60°. When humidity drops below 30° the excessive dryness of the air becomes a very unsanitary factor producing: (1) drying of the mucous membrane of nose and throat, with production or aggravation of catarrhal tendencies; (2) increase of nervous irritability with restlessness of pupils; (3) more rapid development of fatigue, with diminished working power of pupils.

The humidity of schoolroom air may be controlled by a humidifier which introduces moisture into the dry air most advantageously

* Tigerstedt, *Textbook of Human Physiology*, p. 345.

in the main supply flue just after the air has been warmed by passing over the steam pipes. This moisture is supplied best in steam which can be controlled by a humidostat, so that the humidity is maintained automatically within certain prescribed limits.

c) Air when overheated loses some of its health-giving qualities in ways difficult to explain, partly at high temperatures by oxidation, and often gains a disagreeable odor from the burning or charring of fine dust particles. The air should never be heated above 100° Fahrenheit.

d) If the pupils in a schoolroom were healthy and clean and wore clean clothing, most of the disagreeable qualities of school air would be eliminated. Much emphasis should be placed on cleanliness of the schoolroom and of those who occupy it.

e) The inorganic particles in schoolroom dust are not very injurious to health under ordinary conditions, but the bacteria in the air may be deadly. These bacteria, out of doors, may lose power to do harm after a few hours, but in the quiet, darker nooks of a room they may retain disease-producing powers for weeks, months, and even years. It is vitally important that the schoolhouse and schoolroom should be constructed so that it will afford the least possible harbor for germs, and it should permit easy and perfect cleaning. The sharp angles and corners should be replaced by cove ceiling, round wall angles and half-round moldings at junction of floor and walls. The door and window casings should be flat, smooth, and rounded at the corners. The irregular moldings required by unsanitary architectural standards which accumulate dust so perfectly should be altogether lacking.

The floors should be of smooth, well-seasoned, carefully matched boards. The seats and desks and other furniture should be models of simplicity, with smooth surfaces and round angles. The features in school construction which are essential to cleanliness and protection of the atmosphere will not detract from desirable artistic effects. The schoolhouse should be cleaned, but never by dry sweeping or dry dusting. Frequent scrubbing is invaluable. Wet sawdust or oily brooms should be used on the floor for sweeping. Damp or oily cloths should be used for dusting. The vacuum system will in time take the place of other methods of cleaning schools as well as other buildings. In disinfection of rooms where cases of con-

tagious disease have occurred, careful fumigation should not cause neglect of sunning, airing, and thorough cleaning.

f) Where artificial light is required, no other alternative need be considered if electric lights are available. Heating appliances should be so arranged that no products of combustion, even from a stove, may gain access to the air of the schoolroom.

g) The schoolhouse should be so located that the air about it is not endangered by the proximity of any source of contamination. The schoolhouse should never be located on made ground, nor in vicinity of marshes, open drains, or sewers.

The best system of heating large school buildings is the combination of direct and indirect methods. The warmed air passes into the room at a temperature of 70° and supplementary heat when needed is furnished by radiators under the windows. When the building is not in use the direct system maintains sufficient heat in the building.

Ventilation in a large building is maintained by fans. If only one is used the plenum is preferable in order that air may be drawn from a favorable point. When the gravity system for the exhaust flue is maintained, where the exhaust flue carries foul air up by the side of the smoke flue, it is desirable to use the wind pump on the top of the exhaust flue on the roof of the building.

In small school buildings, or the one-room rural school, the stove in the room should never be used unjacketed. By a proper arrangement⁵ of a jacketed stove or simple furnace, with the exit flue running up by the side of the smoke flue and capped by a wind pump, the rural school may have as satisfactory a scheme of ventilation and heating as the most elaborate city school. In all schools outdoor air should be admitted through windows or window ventilators when the weather will permit, and when the street is not noisy. When window ventilation is used for any reason it is always better to lower all windows on one side of the room a little at the top, rather than to depend upon a larger opening in one or two windows, which will be more apt to produce troublesome draft.

The light supply and distribution is a matter of great importance

⁵ Different arrangements of ventilation for rural schools, utilizing similar principles, are described in the School Board Journal, April, 1908, p. 10a and April, 1909, p. 12.

in school sanitation. South and east are the best directions from which to get light. The schoolrooms should be lighted from the left side of the seated pupils. The windows should extend to the ceiling. The glass area should equal one-fifth of the floor area—more than this if windows are shaded by trees or neighboring buildings. Windows should have two sets of opaque shades which roll from the top and bottom of the windows. The windows should be kept clean.

In color, the ceiling should be a light buff or white. The walls should be light green or grayish green.

Difficulties arise concerning school desks and seats in respect to the demands relating to cost, hygienic requirements, and the specific needs of instruction. Little uniformity has resulted in the United States in the use of hygienic school furniture. The flat-topped movable table desks and light movable chairs have proved satisfactory in some schools for lower grades. The pupil should have separate desks and seats which are adjustable in height and for a minus distance. The school seat which represents the most careful study and judgment regarding school furniture at present is that called the Boston school seat.

Certain precautions within the scope of school sanitation are necessary to protect pupils from conveyance of possible infection from one to another. The common drinking-cup is properly and almost universally tabooed. The extent to which it may convey disease from one person to another is almost beyond belief. The chief avenue by which bacteria enter the body is through the mouth. This is quite at variance with the popular idea that most germs are inhaled into the lungs.

The evidence condemning the use of the common drinking vessel upon any occasion whether at school, church, or home is derived from three sources; (1) the frequent presence of disease-producing bacteria in the mouth; (2) the detection of pathogenic germs on the public cups; and (3) the discovery that where a number of persons drank from a cup previously used by the sick, some of them became ill.

Dr. Forbes of Rochester refers to an epidemic of diphtheria in his city which occurred among twenty-four persons and which was traced unmistakably to a common drinking-cup which all the sick had used.

The mortality statistics of the census bureau show that diphtheria, meningitis, bronchitis, tuberculosis, pneumonia, and grippe, all of which are

likely to be acquired by the use of the common cup, are responsible for nearly 400,000 deaths annually in the United States.

The introduction of bacilli into the body through the uninjured wall of the digestive tract, anywhere from the mouth downward, is the chief mode of infection with tuberculosis.⁶

The common drinking-cup should never be used in school, at home, or elsewhere. The drinking-fountain for schools is thoroughly sanitary and the best arrangement where there is running water. The system of individual drinking-cups is satisfactory when the cups are kept in a proper cupboard, covered to protect them from the dust, and under the supervision of the teacher. Individual drinking-cups should never be kept in desks of pupils.

The common towel should never be used. The best solution of the towel problem comes in the cheap, tough paper towels which are destroyed after being used once.

Pens, pencils, and books should be used as individual school property. The slate is not to be tolerated. Books should be disinfected before they go into the possession of another pupil. Molded clay should not be used by a second pupil in the lower grades. It cannot be disinfected and used again. The following lists embody important and practical suggestions regarding hygienic and sanitary habits for school children:

HEALTH "DON'TS" FOR SCHOOL USE⁷

Don't pick the nose; always carry a handkerchief.

Don't wet the fingers with saliva in turning the leaves of a book.

Don't put pencils in the mouth or moisten the point with the lips. Keep the point well sharpened.

Don't wipe pens in the hair.

Don't put pens in the mouth.

Don't put anything in the mouth except food and drink.

Don't "swap" candy, gum, whistles, or anything that is intended for the mouth.

Don't kiss upon the lips; kiss the forehead or cheek.

Don't allow the finger nails to become long or unclean; or neglect the teeth.

Don't face toward another person when coughing or sneezing.

⁶ Davidson, *Death in School Drinking-Cups*.

⁷ *American School Board Journal*, May, 1908.

SIX HEALTH RULES⁸

1. Fresh air and sunshine are necessary to good health.
2. Night air is as good as day air, and in cities where there is much dust, better.
3. Eat little fried food, pastry, cake, candy, and sugar.
4. Wash your hands before you eat.
5. Never lick your fingers when turning pages or counting money.
6. Avoid spitting, because it spreads consumption and other diseases.

In country districts where there is a local water supply for school use, great care should be exercised to make sure that it comes from a pure source. In districts where there is no water-carriage system for sewage the problem of arrangement for school toilets requires special attention. The privy vault should never be allowed on school grounds, even in remote rural districts. The water-tight, cemented cesspool, even, is not wholly defensible at the present day.

In small (one-room) rural schools the dry earth closets will satisfy sanitary requirements, but they need intelligent care and should always be located at least forty to fifty feet from the schoolhouse.

It is desirable that the toilets should be under the schoolhouse roof, and this may be accomplished in rural or small village schools where there is running water, by the use of the septic tank for sewage disposal.

⁸ *American School Board Journal*, June, 1908 (Board of Education, Wilkes Barre, Pa.).

HYGIENE OF INSTRUCTION

Modern education attempts to give the pupil cultural training in preparation for citizenship, and for social and industrial efficiency. Characterized at different times by these and other guiding motives, the work of the schools has gone on through the ages. During more recent times spasmodic attempts have been made to so arrange this school process that it would not, while attempting to accomplish its ambitious and worthy purposes, be harmful to the biologic values which the pupil represents. The hygiene of instruction considers the effects of the educational process itself upon the health of the individual, and would so control and adjust the various factors which collectively make up school work that the pupil's health will not be injured while he is being prepared for future usefulness. That the process of education is always carried on without danger to the pupils' health, even the school men themselves sometimes doubt.

At a recent conference in New York City on the physical welfare of school children, a school principal declared that our present curriculum is manufacturing more physical defects every year than school physicians and school nurses can correct. To the surprise of the laymen present, the school men were of one mind as to the havoc wrought by school life upon the physical and mental energy of the child. We were told that eyes are weakened, if not ruined, by glazed paper, small type, lines of wrong length, unsteady or dazzling light, or prolonged concentration. Dry sweeping fills the air with dust, and combines with bad ventilation, lack of water, and dust-raising physical exercises, to supply conditions that favor the growth of disease germs, more particularly the tubercle bacilli. Seats and desks deform the spine and hips, and cramp the lungs. Required home-study deprives the child of play and sleep and accentuates the effects of harmful school environment. Highly trained teachers explain the composition of air in an atmosphere often more poisonous than that of the average city sweatshop. Boys and girls unable to breathe through the nose because of adenoids and enlarged tonsils are deprived of recess for not being able to describe the passage that leads from the nose to the windpipe and lungs. Children fortunate enough to be physically able to meet school requirements are handicapped in their studies, and for that reason reduced in industrial

efficiency, because they must march side by side with children suffering from removable physical defects.¹

In the past, education has been treated largely as the process of teaching various subjects to children. It was deemed essential that the teachers should know a great deal about the subjects which they were to teach and something about child-psychology. With the evolution of education and the theory related to it, more importance is being attached to the knowledge and supervision of the child-organism. It seems probable that in the near future, as much relative attention will be given, in the training of teachers, to the study of the nature and character, physical, intellectual, and moral, of the child as to the study of his environment and its details, by reaction to which he will be educated.

The understanding of child-life which is necessary to enable the teacher to judge the effect of schooling upon the pupil, must include not only knowledge of child-psychology, but also of child-biology and child-physiology.

First we must know what man is, for man is the far-off goal of all our pupils' development. Then we must discover how a baby grows into manhood, and just what Nature would have us do for him at every age and stage. Only when we have discovered the characteristics of every stage of childhood can we attempt to form a system of education, suited at every stage to gain the co-operation of Nature and thus train men and women of growth and balance, of health and vigor, power and efficiency.

The balance of organs in the child's body, in other words, his constitution in the literal derivative sense, is quite different at different epochs. The great mental changes during youth and early manhood are familiar to us all. The physical changes during childhood and early youth are equally great, but often pass unnoticed or poorly understood. Yet these changes modify or cause certain traits in the child.²

The training which the child is to get should be what is essentially designed for him in his unripe condition, for it cannot be similar to that of an adult. The child is the immature animal; so far different from its fully grown model as almost to want the name of "different creature."³

¹ W. H. Allen, "Broader Motive for School Hygiene," *Atlantic Monthly*, Vol. CI, 1908.

² Tyler, *Growth and Education*.

³ Oppenheim, *Development of the Child*.

As educators have come to realize how different the child is from the adult—different not alone in size, but in structure and function, in relative proportions, in balance of organs, in constitution, in power of endurance, in fact, in every element which is concerned in the making-up of the final stage of maturity—it has become evident that this knowledge must be fundamental in judging what will be best for the child.

Consideration of the manifold and often subtle organic changes in the comparative development of childhood would be too long and technical a task at this time, but careful study of this relatively new and important phase of child-study will well repay any teacher who wishes to deal fairly and justly with the children who are being trained.

Without attempting any complete survey of the many difficult and intricate phases of this important field, brief reference may be made to some of the fundamental elements of the problem.

I. The pupil should present himself at school in the morning in the best possible condition to profit by the process of instruction. Two factors of daily living are prominently related to the pupil's condition and therefore are of direct importance to the school.

HOURS OF SLEEP REQUIRED AND MENTAL WORK PERMISSIBLE FOR CHILDREN OF DIFFERENT AGES

Age	Hours of Sleep	Time in Bed	Hours of Schoolroom and Other Mental Work
5-6.....	13	6 P. M. to 7 A. M.	3
6-8.....	12	7 P. M. to 7 A. M.	3½
8-10.....	11½	7:30 P. M. to 7 A. M.	4
10-12.....	11	8 P. M. to 7 A. M.	4½
12-14.....	10½	8:30 P. M. to 7 A. M.	5 to 5½
14-16.....	10	9 P. M. to 7 A. M.	6
16-18.....	9½	9:30 P. M. to 7 A. M.	7
18-20.....	9	10 P. M. to 7 A. M.	8

a) Rest and sleep after the previous day's activity. If the night's rest has not been sufficient to restore the organism completely after the exertions of the previous day, the child begins the day partly tired out, with crumpled or haggard nerve cells, quite unfit for normal, satisfactory responses to stimuli. If the child continues in this partially tired-out morning condition, there is a condition of chronic nervous exhaustion of some degree at least, and this will

prevent good school work, while it renders the child more susceptible to disease and may seriously interfere with physical, mental, and even moral growth and development. Many school children do not spend enough hours out of each twenty-four in bed in a room which is as widely open to the outdoor air as wide open windows will permit.

Nothing can make good to the individual the loss entailed by deficient sleep during childhood.

b) The child as a preparation for the day's programme in school, should eat an unhurried, nutritious breakfast, and get to school on time, without rushing. The child machine must be properly coaled up before beginning the work of the day. If the pupil does not sleep well, and does not eat a good breakfast, these faults should be corrected.

II. The school programme should be arranged for the class and adapted so far as necessary to the individual pupil with reference to genuine fatigue, which means quite normally a lessening of working power as the day proceeds. Fatigue resulting from a reasonable day's activity disappears after a sufficient night's rest.

Abnormal fatigue, or what Dr. Cowles has significantly called "pathological fatigue" may be due to many things. Overwork is commonly supposed to be one of them. It may be said, however, that in children this is not very frequently the case. Results usually attributed to "studying too hard" are owing very directly to something else. Much more frequently, dangerous fatigue is the result of unhealthy confinement within doors, or is owing to unwholesome shocks and puzzlings, and confusions, and conflicts of impulses resulting from the imposition of scatter-brain notions of teaching and discipline—imposed much too fast for the child to grow to, or even to comprehend.

Children who, through heredity or accidental stress, are unusually liable to pathological fatigue, should have special provisions made for their especial educational needs. Every large school should have the services of an expert teacher who has been technically trained for this particular work.*

To sum up: Fatigue in the schoolroom may be largely decreased, if not reduced to the minimum, by more frequent use of rest periods; by arranging stronger contrasts in the daily programme, as well as securing a wiser adjustment of difficult subjects to the best working hour; by patient and

* Smith Baker, "Fatigue in School Children," *Educational Review*, January, 1898.

wise training of pupils into better habits of study; by a better utilization of the doctrine of interest; by lessening nervous tension in the schoolroom; and by wise use of play under supervision.

There is a vital distinction between fatigue (*Ermüdung*) and weariness (*Müdigkeit*). A child at play may become fatigued, but never weary of his activity; a boy engaged at work in which he takes no interest may become so weary in fifteen minutes that he can accomplish nothing. . . . Tedium produces the feeling of weariness which is distinctly different from fatigue itself.⁵

It should be remembered, however, that a feeling of weariness may quite normally come on with increasing fatigue, though the former is by no means a constant and accurate index of the latter.

Ribot says: "Fatigue in every shape is fatal to memory." Every teacher, therefore, should be familiar with the indication of fatigue, with the conditions which most rapidly induce it, and with the means that may be employed to avoid, to reduce, or to overcome it, so that the maximum of effort may be attained by the minimum expenditure of energy.

Our psychologists tell us that with the normal pupil mental fatigue in school work is quickly induced and also quickly passes away. Mental efficiency, or the increments of skill gained through mental training, is much more permanent in its character and is not soon lost. If this be true, in order to attain the highest possible maximum mental efficiency, with the greatest economy of effort, provide working periods with more frequent rest periods, and thus secure through this power of the mind to recuperate rapidly, an almost continuous high state of mental vigor. . . . The mind, instead of being as we supposed like an old-fashioned sensitized plate of the photographer, which required a long exposure, is, after all, more like the highly sensitive plate of the snapshot camera. . . . We need, especially in the lower grades, to bring in these more frequent rest or exercise periods, believing that the increments of power gained from mental activity will not be dissipated through such slight interruptions, and that efficiency of public school work will be greatly increased as well as relieved of much of its present drudgery.⁶

III. The eyes of school children should be protected from excessive strain, especially in the lower grades, by every possible means which ingenuity and forethought may devise. Abnormalities of

⁵ H. E. Kratz, "How May Fatigue in the Schoolroom Be Reduced to a Minimum?" *Proceedings of the National Education Association* (1899), p. 1090.

⁶ *Ibid*

the eyes which are either partially caused or aggravated by school work increase from the lower to the upper grades.

Indeed, extensive examinations of eyes of school children, in addition to showing the small proportion of normal eyes, have shown that a very large proportion present an unhealthy appearance, or even the beginning of disease of the deeper, more important structure of the eye. The least trouble was found in the lower grades, markedly increasing toward the higher, as did also the average degree of error, proving unquestionably the effect of the educational systems on the eye.⁷

Proper care of eyes in school work necessitates: (a) very little fine work for young children; (b) books with large, distinct letters and figures printed on unglazed paper; (c) use of large characters on clean blackboards; (d) use by pupils of coarse writing pens or soft pencils (slates should never be tolerated).

IV. Recess and frequent short intervals of rest and relaxation between periods should be preserved in the arrangement of the school programme at whatever cost of convenience, or difficulty of supervision.

Kraepelin, Friedrich, and others have observed that pupils work best when school sessions are interspersed with short periods of rest.⁸

School instruction is for the mentally and physically growing child work, and consumes his mental energy. If it becomes overwork, it checks his mental and physical development. It is shown by these and other experiments, and insisted on by many educators, that short intensive study hours are better than long ones. Especially with children in the lower grades, fatigue increases very rapidly with the continuation of instruction. The child should be granted a recess of from eight to fifteen minutes after every sixty minutes, the time to be spent in attention to bodily needs, to rest, and to the taking of nourishment. The severer studies should find a place in the earlier morning hours. Whether there should be any afternoon session at all is questionable. At any rate, only light exercises, such as penmanship, singing, etc., should be permitted in the afternoon.⁹

It should be remembered that formal gymnastics rank with mathematics among the most rapidly fatiguing of all forms of instruction.

⁷ S. T. Easton, "Public Schools and Eyesight," *Education*, February, 1901.

⁸ O'Shea, *Dynamic Factors in Education*, p. 284.

⁹ Patrick, *Studies in Psychology*, Vol. I, p. 80.

V. The school schedule should not require formal or artificial tests and examinations which seriously disturb the nervous state or health of the pupil, either at the time of the test, or by a period of abnormal nervous tension during preparation for such tests.

There is another habit of our school which I have frequently had occasion to deprecate. I allude to the system of term examinations in vogue in many schools for the purpose of determining the class standing of the pupils. The procedure calls into play in a most extraordinary manner the ambition of the pupils, for the reason that their promotion is contingent upon their ability to pass it successfully. For weeks before the expected trial the hours of work are prolonged, the rest interfered with, the child becomes nervous and irritable, and the tone of health impaired. The eyes often suffer seriously under the baneful influence of this prolonged strain. I have very many times been annoyed and disappointed over almost sudden relapse of choroidal disease, in patients under observation, often with an increase of near-sight indicating a distention of the eyeball, brought about by the stress of work required in preparation for the examination at the close of the school year.¹⁰

VI. Promotions by subjects with a relatively loose classification of students in grades or classes are much more favorable to the health of pupils than the traditional promotion of an entire class at the end of the year or half-year. This is particularly important for girls in the upper-grammar and high-school grades, when the promotion tests are more severe and "caste feeling" as related to standing in class, and promotion with class, is very pronounced. While it often happens that the desire to keep up with the class may serve as a useful incentive to do good work, still it frequently operates disadvantageously to the individual pupil. Not infrequently the high-school girl, whose health at puberty demands a partial programme, sometimes at menstruation several days' absence, or perhaps the dropping out of school for a year, suffers such chagrin and unhappiness that parents and teachers allow her to struggle along, even though she may suffer serious and permanent injury. Educational organization should be elastic enough to provide for the needs of individuals—within reasonable limits—as well as for the training of typical groups.

In fact the normal child should not be the primary consideration of any

¹⁰ S. D. Risley, "Defective Vision in School Children," *Educational Review*, April, 1892.

system of promotion. The non-normal child, who belongs to the majority, or at least to a large proportion, is crying for recognition. He must be given the opportunity to travel his own pace. Even the normal child of one year is not necessarily the normal child of another year. The conditions which produce retardation or advancement are several, and these may vary. The child's own growth rhythms, for example, may put him in a condition to do normal work one year, and less or more than normal work another year.¹¹

VII. The teacher is the most important factor in relation to the hygiene of instruction.

a) Higher standards of health must be demanded of the teacher if she or he is to exert an influence upon the sensitive, plastic child which is salutary and altogether wholesome.

b) The teacher must be protected from overpressure and chronic fatigue through: (1) personal rational habits of living; (2) limitation by school authorities of the teacher's duties so that health preservation is possible.

Various aspects of the hygiene of instruction have been suggestively summed up in the conclusion of two writers:

1. The mental effort of which the child is capable is primarily connected with physical activity and with sense perceptions.

2. The physical activity most needed by developing childhood is not found in formal and artificial systems of exercise, but in plays and games, in the various occupation imitations of childhood, in gymnastic games, and in the progressively difficult demands of well-directed manual training. These present mental as well as physical problems, fully adapted to the child's stages of development, and insure adequate mental and physical growth up to the age of eight or ten.

3. The conditions favorable to the mental development of a child seven years of age are not found in arithmetical processes, but in concrete number relations; not in the science of language, but in its use; not in the use of symbols, as in reading, nor in the efforts at fine motor co-ordinations, as in writing with pen or pencil, but in drawing and picture writing on the black-board (in games and industrial training) and in the fascinating study of plants and animals.

4. The wholesome development of the child's nervous system depends upon maintaining his interest in school work, fostering and directing his spirit of inquiry, and satisfying his love and need of activity. Substitution

¹¹ Burk, "Promotion of Bright and Slow Children," *Educational Review*, March, 1900.

and suggestion must take the place of prohibition and repression. The true discipline is the self-control of interest.

5. The teacher must not be misled into demanding logical sequence of continuity from the child. Superficiality is both the safeguard and the stimulus of childhood.

6. Not less than one-half of the school time of the primary-school pupils should be devoted to physical activity in its various aspects, and the remaining time should be devoted largely to nature-work, drawing, oral descriptions, and oral reproductions.

7. The child's increase of mental power is not in proportion to the mental effort he is forced to make, but is largely determined by natural physical growth.

8. The final test of primary-school work must be—is it joyous? does it give full scope to the play impulse?¹²

The physical organism, regarded from one standpoint, is a contrivance for generating energy needed for the support of all activity, whether physical or mental. When the stock of available energy in the organism at any time is depleted beyond a given point then serious disturbances must ensue. In a fatigued condition one cannot accomplish as much ordinarily as when he is refreshed. His perception, his memory, his reason, are rendered less keen and ready and accurate; his endurance in labor of any sort is lessened; he cannot perform tasks demanding the finest and most exact motor co-ordinations. Some pupils will become unduly tense in all their actions, while others will grow lethargic and indifferent. Restlessness and irritability will take possession of a schoolroom under such conditions.

If one is to attain the greatest efficiency, he must use his energy economically; he must avoid all practices that squander his resources. Needless motor tensions drain off the vital forces without accomplishing anything, and they must be reduced to the minimum. And first of all by changing the state of mind which begets them. Worry, fear, self-consciousness, over-scrupulousness, dissipate energy. Teachers especially need to bathe their spirits freely in the best books, the best art, the best music, and the best social life. They should keep an eye on their pupils, too, and seek to encourage in them habitual attitudes of courage and hope and joyfulness. It should be the aim to do one's work without wasteful muscular tensions. Usually tasks requiring very fine adjustments entail waste, and they should not be undertaken when unnecessary. It is the teacher's duty to banish from the schoolroom all implements, in the management of which there is demanded precise co-ordination, where coarser activities would

¹² Fitz, "Hygiene of Instruction," *Proceedings of the National Education Association* (1898), p. 545.

answer just as well. Very fine writing, or sewing or weaving and the like should be abolished. All the equipments of the school, especially the seats, must be chosen with the end in view to reduce to the lowest point the waste of nervous energy in pupils. Finally, well-poised, calm-voiced, and calm-featured teachers, who are at the same time positive and definite and, in short, *strong*, are the most important pieces of apparatus that can be placed in any schoolroom, regarded from the standpoint of the conservation of the nervous energy of pupils.

In arranging the daily programme it should be the aim to have pupils give concentrated attention for brief periods only to the work in hand. One hour of real hard work is worth three of mind-wandering, and it is far more conservative of vital forces. Some account should be taken of the "course of power" in the day, and an effort should be made to get all school work done while the energies are at flood tide. Especial pains should be taken to so arrange the programme that it will not be necessary to hold pupils to their tasks when the waning of their powers leads to relaxed attention, so that they fall into frequent errors, and thus put themselves into an unhappy relation toward their environment.¹³

¹³ M. V. O'Shea, *Dynamic Factors in Education* (1906), p. 297.

HEALTH INSTRUCTION

This is one of the most perplexing problems in education today. No phase of instruction seems more important than to teach the child how to live in a healthful manner. No subject is taught, on the whole, so unsuccessfully. In considering the traditional and present methods of teaching physiology and hygiene, several purposes appear to have exercised varying degrees of control over such teaching. These purposes may be classified thus:

- a) To teach these subjects—physiology and hygiene—as branches of science, with observance of methods employed in other branches of science and with applications of this knowledge to hygiene when such applications appear to be feasible. The teacher possessing this as the main motive, has ordinarily had more training in pure science than in hygiene, and the teaching shows corresponding distribution of emphasis.
- b) To give instruction in facts and principles of hygiene on a basis of as much anatomy and physiology as seems necessary to support the hygiene teaching. This kind of teaching is often as theoretical on the hygienic side as would be given with the first-named purpose, and frequently the scientific basis is inaccurate and generally defective.
- c) To provide the temperance instruction required by law in the various states and to supplement such instruction with the additional material contained in the required textbooks. This represents the prevailing motive and method in the teaching of physiology and hygiene in the schools of the country. The teaching is done in obedience to law, often in a perfunctory manner, without much interest on the part either of teacher or pupil and with very little apparent after-benefit, so far as one may judge from the impressions recalled in after years by those who received this type of instruction.

Now, nothing can be more readily shown than that in the case of most individuals the knowledge of the ill effects of unhygienic activities does not in itself result in the formation of hygienic habits. . . . We eat welsh rarebit and pumpkin pie, in spite of nightmare and nervous indigestion. It

takes something more than physiology—more than toothache itself—to make children use a tooth-brush after every meal. And just as certainly, boys who do not stand aghast at the abasement and the menace of the drunkard, will not be prevented from drinking solely through knowledge of the various ill effects of alcohol on the heart and nervous system.¹

An investigation of the methods and effects of the conventional teaching of temperance, physiology, and hygiene in public schools, which was conducted by a special committee of the New York State Science Teachers Association showed that in a moderate number of schools where the instruction was given in an earnest fashion by teachers who were alive to the reasonable possibilities, some satisfactory results were obtained.

d) To inculcate in pupils habits of healthful living in relation to personal, home and community life, through the study of sanitation, bacteriology, simple facts of hygiene, and by encouragement of wholesome play, athletic ideals, a spirit of reasonable personal ambition, and social helpfulness. This method and approach have been utilized all too rarely, but have when used been productive of splendid results.

On the whole and up to the present time, the teaching of hygiene in the schools has been inadequate and unsuccessful. The following reasons are proposed to explain in part this lack of success:

1. The teachers generally lack conviction regarding the value of the instruction as ordinarily given and, partly in consequence of this, have little if any interest in such teaching. There is abundant reason for this lack of conviction and interest as the methods of teaching are felt to be faulty and the effects insufficient to justify the time and effort given to the subject.

2. The teachers are too frequently wanting in the practical personal standards and habits of individual hygienic living which are essential as the primary elements to give authority and power to such teaching with reference to its applications. The effective teacher of this subject must give expression in personality and conduct to the principles of hygiene which are being taught.

3. The teachers in the majority of instances do not possess the information, the scientific and practical knowledge needed for the

¹ Yocom, "Teaching of Hygiene in Elementary Schools," *American School Board Journal*, November, 1908.

clear presentation of material which should be wisely selected and adapted to the needs of the pupil at the time.

4. Teachers give as one reason for neglecting hygiene, that they are often compelled to struggle with a curriculum, which requires more than they are able to teach and more than pupils are able to learn in the time allowed. While an overcharged curriculum may explain, it surely does not justify, the violation of law and the dropping of hygiene from our school curriculum. If there is any class of citizen who should teach and practice respect for law as law, it is the teacher. Parents, school directors, county and state superintendents, university presidents, social workers, owe it not only to themselves, but to the American school teacher, either to repeal the laws that enjoin instruction in hygiene or else so to adjust the curriculum that teachers can comply with those laws. The present situation that discredits both law and hygiene is most demoralizing to teacher, pupil, and community. Many of us might admire the man teacher who frankly says he never explains the evils of cigarettes because he himself is an inveterate smoker of cigarettes. But what must we think of the school system that shifts to such a man the right and the responsibility of deciding whether or not to explain to underfed and overstimulated children of the slums the truth regarding cigarettes? If practice and precept must be consistent, shall the man be removed, shall he change his habits, shall the law regarding instruction in hygiene be changed, or shall other provision be made for bringing child and essential facts together in a way that will not dull the child's receptivity?

Teachers are made to feel that while arithmetic and reading are essential, hygiene is not essential. Whatever may be the facts regarding the relative value of arithmetic and hygiene, whether or not our state legislators have made a mistake in declaring hygiene to be essential, are questions altogether too important for child and state to be left to the discretion of the individual teacher or superintendent. It is fair to the teachers who say they cannot afford to turn aside from the three R's to teach hygiene, to admit that they have not hitherto identified the teaching of hygiene with the promotion of the physical welfare of children. Teachers awake to the opportunity will sacrifice not only arithmetic but any other subject for the sake of promoting children's health. They do not really believe that arithmetic is more important than health. What they mean to say is that hygiene, as taught by them, has not heretofore had an appreciable effect upon their pupils' health.*

5. The present teaching of physiology and hygiene involves too many facts of anatomy and physiology. It is doubtful whether any teaching of anatomy and physiology as such is advisable in ele-

* W. H. Allen, *Civics and Health*, p. 4.

mentary or grammar grades, and very little if any is needed in the high school. Not until the student is of college age, at least, is the study of human anatomy and physiology beneficial to the individual, except in the presentation of very general facts and principles relating to the body's construction and function which may strengthen the argument in support of hygienic living. That is, the claim here is made that nowhere in the school should these subjects be taught systematically as branches of science. Much of the material of instruction in physiology and hygiene is uninteresting, difficult, and beyond the clear comprehension of the pupil. One author of an elementary-school textbook very frankly entitles his first chapter "Dry Bones." Educators know that hygiene is required by law. They assume that it is an important subject and that the child must know the anatomy and physiology to understand the hygiene. And the children try to memorize dry details of physiology and to understand facts and principles which are too complex for them. The most absurd and ludicrous records of school tests are made up by the ridiculous, grotesque, not to say inaccurate answers to questions in human anatomy and physiology. And the same types of answers result from all kinds of teaching, indicating that something is inherently wrong in the materials and methods of teaching. Much of the description in textbooks is beyond them, and many of the illustrative cuts are not understood. In addition to the foregoing, the direction of the pupil's attention to the structure and function of his own body results often in disturbed self-consciousness; is pedagogically unsound; and contributes little to hygiene teaching. On the contrary, it may directly interfere with the desired hygienic application and antagonize the pupil in relation to the whole subject. The psychology of physiology teaching has not yet been worked out in any satisfactory fashion.

6. The instruction in this branch of education is too largely theoretical, too little related to, and judged by, the conduct of the pupils. The tendency now throughout the schools is to value mere information less and to esteem more highly useful reactions and habits. In this field most of all, unless it be in the moral field which it is impossible and undesirable to separate from the broadly hygienic, it is fundamentally important to judge results of hygiene

teaching by the practical application in actual and immediate living.

7. Too much emphasis in hygiene is directed to the personal health of the pupil, too little to the health and well-being of members of the home and of the community. The child is not interested in his own health, nor should he be except as he realizes in a rather vague way that "to be well and strong" enables him to do things that seem worth while, to help the members of the household, the teacher and other friends, to be useful generally. Actual answers to questions concerning health obtained recently in different elementary grades indicate the direction of pupils' interests. In the first four grades the following questions elicited the answers quoted:

a) *What does it mean to feel well?* The word happy was used in nearly all of the answers. These answers were given: "glad"; "feel like doing things"; "nice"; "not cross"; "laughing all the time"; "running and jumping."

b) *Why do you wish to feel well?* Nearly all said: "So I can play and go to school."

c) *How can you become big and strong?* "Bathe"; "Eat good food"; "Drink milk"; "Climb a lot"; "Mind Doctor (school physician) and Miss (gymnasium teacher)."

d) *How can you help others grow big and strong?* "Take the baby to the Park every day"; "Make your small children to wear rubbers when it rains"; "Don't let your father smoke in the kitchen." One little first-grade girl with a strong instinct for self-preservation, said: "I wouldn't help other people, I might catch it myself."

In the fifth grade the following questions were asked:
(a) What does health mean to you? (b) Why do you want to be well? (c) How can you become well and strong? (d) Name the persons who help you most in keeping well and strong.

Nineteen papers were collected. The idea of "feeling well," "happy," "strong," "bright," "lively," "not sick," was expressed fourteen times in connection with the first question. One child said, "Health makes you feel like going some and not to feel lazy." Another, "To feel well makes you feel like being out of doors," and another replied, "Health is when you are in danger of Tuberkolosis."

To the second question fifteen pupils gave emphasis to the fact

that they want to be well in order "to go to school," "to be out of doors," "to be able to see friends," "to romp in the park," "to chase with my dog." One said, "I want to be well for when I am sick I have pains and that makes my mother feel sad." Another answered, "I want to be well for then you don't have to pay Dr.'s bills." This economic value of health was repeatedly expressed by the East-side boys.

To the third question, the advice given for maintenance of health was related generally to proper food, clothing, exercise, and sleep. Of the person who helped in keeping them well and strong, mother held first place with the doctor a close second. With the East-side boys this order was reversed.

In the sixth grade the questions asked were practically the same, with the addition of: "Is it better to play out of doors or in the house and why?" These children gave the same emphasis to health as a means of happiness. Two said, "Health is happiness." All gave expression to the general idea that being well means out-of-door freedom and ability to do things and to go to places. Practically the same health suggestions were given with strong emphasis upon exercise. This was especially evident in the papers written by the East-side boys. One boy said, "Exercise two times a day sometimes," and another, "Sure it is better to always play out of doors."

The question regarding the care of others brought some interesting answers: "If I am sick and it is contagious, not to let others get it"; "do for others like helping to get a milk station for babies"; "Be careful about spitting on floors"; "Tell people to sleep with windows open"; while one child surprises us with this store of "Don'ts": "Don't put snow down their backs; Don't breathe in other people's breath; Don't let somebody eat from your plate or drink from your cup."

These children were unanimous in the decision that mother helps more than anyone else in keeping them well. Father with the ability to pay bills was mentioned three times, the doctor, eight times, the street cleaner, janitor, milkman, and policeman were also mentioned. One child said, "My father helps me most, he keeps me strict and clean," while an analytical youth replied in this manner: "Mother (she cares for me); Father (the same); Milkman (because of pure

milk); Policeman (because of law and justice); Teacher (because of education)." All agreed it is better to play out of doors than in the house.

In the seventh grade the questions were the same in spirit with the addition of, "In order to be well and strong what are some of the things necessary to both plants and animals?"

To the first question all responded freely giving the same emphasis to the happiness side of life. One wrote: "Health means happiness, comfort, joy." In reply to: "Why do you wish to be well and strong," the answers were similar to those received from the fifth and sixth grades, only they were more definitely and maturely expressed. Among the answers were, "I want to be well to have plenty of schooling and games"; "I want to be well so I can play basket ball tonight"; "I want to be well to have a good time, be happy and as God wants me to be." The health suggestions were much like those noted before, pure food, exercise, cleanliness, being emphasized. The question regarding the care of plants brought out the ideas of similar care—they should, like a person, be bathed, given good food, air, and sunlight.

In the eighth grade the pupils stated that health means "success," "joy," "strength," "pleasure," "rosy cheeks," and "happiness." They want to be well that they may "have fun," "go to church, school and parties," "gain weight," and "not be a drudge to other people." Their health suggestions are confined mainly to the fresh-air exercise problem, while those for helping others are rather more surprising: "Don't spit in open places"; "Be clean at home same as at school"; "Keep yourself well; that will help others"; "Behave so you don't put an extra strain on your teacher"; "Don't pet anybody; come to school without an examination."

8. Another reason for unsatisfactory results in hygiene teaching is that too much attention is given to disease and not enough to health. This has been the case in much of the temperance instruction. Children may sometimes be instilled with wholesome fear by presentation of pathological effects of alcohol and narcotics. More frequently, however, if not depressed by disease pictures, they consider facts with wonder, sometimes with amusement, often with skepticism and indifference, but the constructive health influence would be much better gained by pointing out the domestic, social,

and economic evils resulting from intemperance and giving strong emphasis to ennobling ideals, or to positive standards of health, and power to do.

9. The present textbooks are on the whole quite unsatisfactory, because they contain too much anatomy and physiology with illustrations which are either not understood or too largely negative in effect. Very few textbooks contain enough sanitation, public health, bacteriology, practical individual, social, and industrial hygiene.

10. With the present prevalent method of teaching physiology and hygiene as a branch of science, error is made in teaching this subject in the first year in high school, before the pupil has had natural science, physics, chemistry, and zoölogy, which usually come in the later high-school years.

CONSIDERATIONS RELATING TO THE EFFECTIVE TEACHING OF HYGIENE

I. Health teaching includes two factors: (*a*) hygiene—the healthful conduct of the individual; (*b*) sanitation—the maintenance of an environment favorable to human health. Both aspects should be kept properly balanced and interrelated, in the educational progress of the child. No more human anatomy and physiology should be taught in elementary or high school than is necessary to make clear hygienic application, and this is very little indeed, much less than is taught now throughout the schools of the country. The study of his own body or mind by the pupil through systematic and detailed analysis should not be attempted until the individual is nearly or quite mature. Too early study of this kind not infrequently leads to morbid self-consciousness which may involve the body as well as the mind.

The power to concentrate attention upon oneself is a sign either of a diseased body, a diseased mind, or a highly trained mind.

The problem of health is not how to have a healthy stomach, but how not to know that you have a stomach, which comes to the same thing. The maintenance of health depends not upon continuous attention to bodily needs—which will wreck the health of the strongest—but on the formation of healthy habits and the value of such habits is that, once formed, they can be left to the subconscious mind, whilst the conscious self instead of feeling itself forever chained to the body of this death can dance in its fetters.³

³ Saleeby, *Health, Strength, and Happiness*, p. 13

The cellular structure of the body, as bearing upon exercise and exhaustion; the rapid multiplication of microbes and bacteria in relation to antiseptic and prophylactic treatment; the menace of cats, house flies, and mosquitoes, and the quick souring of milk; precautions necessary to the prevention of the spread of tuberculosis; oxygen as a purifier of the blood; the cubic air space that should be allowed for each individual indoors; the principles of ventilation; the general functions of heart, lungs, arteries, and veins without regard to particular valves and veins; the relation of crookedness, decay, and absence of first and second teeth to digestion, and the precautions necessary to protect their enamel; tests for common food adulterants and the laws regarding pure foods and public health in general; the relation of overfeeding and overexercise to mental torpidity; marked symptoms of dangerous diseases for which a physician is needed; the usual remedies for familiar forms of sickness commonly given home treatment; all prophylactic precautions possible to the masses—if these and other facts directly bearing upon healthy habits are associated with them through continual repetition and persistent practice, little time will remain in the elementary school for the details necessary to the mastery of physiology as a science.

Since hygiene means habit, the general basis for the grouping of hygienic data should not be anatomical and physiological structure, but the activities that make health, whether they are personal, social, or political. For example, all useful knowledge bearing upon the circulation of the blood should not be centered about the heart and lungs, but rather all facts likely to serve as a stimulus to the breathing of fresh air should be grouped together or all that tend to result in cleanliness of person and environment.⁴

There is a growing body of conviction in the minds of many that the illustrative material for health instruction should be taken from actual life, even if this involves certain morbid conditions in the environment, but that butcher-shop specimens should never be used, nor should dead creatures and dissections of animals in the laboratory be employed in the teaching of physiology and hygiene.

II. Teaching hygiene and sanitation in the schools should aim at direct inculcation of health habits as much as at the imparting of knowledge concerning hygiene and sanitation. School credit for hygiene teaching should be based partly and primarily upon the extent to which the pupil lives hygienically. Credit in hygiene is now included in the requirements for graduation from the New

⁴ Yocom, "Teaching of Hygiene in the Elementary School," *American School Board Journal*, November, 1908, p. 4.

York public schools and also for promotion from grade to grade. The first item in these requirements reads:

Practical hygiene.—The effort and success of the student to follow out the instructions in hygiene on matters of cleanliness of the face, and fingernails, mouth, teeth, hair and clothing, should form the greater part of the item.

III. Hygiene should be taught continuously throughout the school life of the child. Such instruction in the elementary school can best be given, not through a special course in hygiene, but by the natural, reasonable application of any fact or principle which may arise in connection with any subject, to the problem of healthful living. Such applications may be made sometimes in school assembly and frequently in schoolrooms to the class of children or to the individual pupil. Frequently opportunity will be found in relation to season of year, weather, interest in games and festivals. Correlation should be made with other subjects of the school curriculum, e. g., nature-study, primitive life, industry, etc., wherever such applications in health teaching may be made in a reasonable and effective way.

Every step takes on new meaning when the learner sees its place in the series of operations culminating in the commercial food supply of his own community, its sanitary regulation and domestic consumption. The elements of physiology and hygiene, and of physics and chemistry, are also called into requisition; they are all indispensable in fixing values of industrial products and determining economy in technical operation. What makes for hygienic living is as well worth knowing from the economic standpoint as what mechanical appliance will most increase the output. A proper study of the industries, therefore, I contend, will bring about a unified and closely correlated course in the biological and physical sciences by way of supplying the information wanted by the child in adjusting himself to the real world.⁵

In the elementary school as well as in the high school and college, correlation may be made between hygienic and ethical and social values. The fundamental ethical principles are closely related to the large, primitive, physical, and racial aspects of living.

IV. While attention of course should be given to the personal health of pupils in teaching hygiene, much emphasis should be

⁵ J. E. Russell, "School and Industrial Life," *Educational Review*, December, 1909.

placed, as already suggested, upon the health of school, home, and community, and the obligations of the pupil in relation to these social interests.

Children, like adults, can be interested in other people, in rules of conduct, in social conditions, in living and working relations more easily than in their own bodies. The normal healthy child thinks very little of himself apart from the other boys and girls, the games, the studies, the animals, the nature wonders, the hardships that come to him from outside. . . . Human interest attaches to what parks or excursions are doing for sickly children, how welfare work is improving factory employees, how small-pox is conquered by vaccination, how insurance companies refuse to take risks upon the lives of men or women addicted to the excessive use of alcohol or tobacco. Other people's interests—tenement conditions, factory rules—can be described in figures and actions that appeal to the imagination and impress upon the mind pictures that are repeatedly re-awakened by experience and observation on the playground, at home, on the way to school or to work. "Once upon a time" will always arrest attention more quickly than "The human frame consists—." What others think of me helps me to obey the law—statutory, moral, or hygienic—more than what I know of the law itself.⁶

Because the problems of health have to do principally with environment—home, street, school, business—it is worth while trying to relate hygiene instruction to industry and government, to preach health from the standpoint of industrial and national efficiency rather than of individual well-being.⁷

Sanitation then, in its various aspects, should form a prominent part of the health instruction of the pupil at all ages. Bacteriology has a legitimate place in the high school and in simpler presentation even in the elementary schools.

Such courses should be given in the public schools in such grades as to reach the children between eight and sixteen years old; these courses should consist in their simplest form of demonstrations, through use of agar or gelatin plates, of the existence and distribution of bacteria in air, water, milk, dust, feces, etc., and especially on hands; extending somewhat in scope and in individual experimental work as the grades are ascended. Microscopes would not be essential and the necessary apparatus and media could be furnished at a very low cost. . . . In the high schools, gradual advance in the detail of experiments should be arranged with the quantitative experiments, possibly some species work, and the microscope should be introduced.⁸

⁶ Allen, *Civics and Health*, pp. 7-8. ⁷ *Ibid.*, p. 10.

⁸ H. W. Hill, "Bacteriology as a Non-Technical Course for Public Schools," *Science*, November 5, 1909, p. 627.

V. The textbooks for health instruction in the future will differ widely from the great majority in present use. These must present for teacher and pupil the impersonal material of sanitation, bacteriology, civics, applied sociology.

VI. The pupil should get health instruction from many sources, from parents, family doctor, older brothers and sisters. So far as the school is concerned, the teacher who knows the pupil best and is brought into closest contact with him will have the best chance to teach health as well as ethics. In the elementary school the grade teacher will have this opportunity and responsibility. In the high school this task will fall to the special teacher who has the greatest interest in health teaching, the best preparation for such instruction, and the most favorable opportunity to influence personality and habits of the student. With the present trend in education the teacher of physical education will be most favorably situated to deal with the personal, social and ethical aspects of health. The bacteriology must be taught by the teacher who has had special training in this phase of biology with the laboratory methods.

VII. Finally, the accomplishment of this broad, well-rounded health instruction in the schools must necessitate a clear appreciation by boards of education, superintendents, and principals of what should and may be accomplished. The teacher must have broad and thorough preparation for this instruction. Such professional training must be given in the institutions where teachers are prepared for their work. If teachers are already overburdened and have too many subjects now, to learn and to teach, then other things must give way and make place for this health side of education if it is as important as it appears to be at present.

Passing reference only is made here to the teaching of sex hygiene in view of the encyclopedic report on this subject, presented by Professor Henderson in the *Eighth Yearbook* of this society.

Instruction with reference to sex is, in many respects, the most vital and important phase of health education. The possible direct and indirect benefits of needed work in this line upon the well-being of the individual, the home, and society at large cannot be overestimated.

Adequate instruction in sex hygiene cannot be given until:

(a) Enlightened public opinion recognizes sufficiently the necessity for such instruction, and exhibits confidence in the ability of responsible advisors of children and youth to give the instruction needed; (b) Teachers are intelligent, wise, and tactful enough to give such instruction and guidance successfully. Comparatively few teachers today are capable of meeting the obligations which are involved in relation to the teaching of sex hygiene.

PHYSICAL EDUCATION

The term physical education is employed in some institutions and by some thinkers and writers to include all the different factors in education which have to do with the health of the pupil or student. Physical education is used here more narrowly and technically as referring to the supervision of large fundamental motor activities, expressed in play, games, dancing, swimming, gymnastics, and athletics.

The history of physical education presents in interesting progression the different ideas obtaining through the period of recorded history regarding the relationship of physical education to the life and education of the human being. The Greek idea as developed by the Athenians represented a balanced conception and practical realization of the relation between the physical and other aspects of education which have not been equaled since that period. The aim of the Athenians was to develop a beautiful mind in a beautiful body.

Everything that is good [says Plato in the *Timaeus*] is fair and the fair is not without measure, and the animal who is fair may be supposed to have measure. Now we perceive lesser symmetries and comprehend them, but about the highest and greatest we have no understanding; for there is no symmetry greater than that of the soul and body. This, however, we do not perceive, nor do we allow ourselves to reflect that when a weaker or lesser frame is the vehicle of a great and mighty soul, or, conversely, when a little soul is incased in a large body, then the whole animal is not fair, for it is defective in the most important of all symmetries; but the fair mind in the fair body will be the fairest and loveliest of sights to him who has the seeing eye.

Well might Charles Kingsley say of the Greeks, "To produce health, that is, harmony and sympathy and grace, in every faculty of mind and body, was their notion of education." The sculpture and literature which have come down to us from the best period of Greek civilization show how remarkably they achieved their ideals of beauty.

The climax of the physical education of the Greeks occurred in the Olympic games. It is a sad commentary on the sanity of the present time that in the attempt to revive the Olympic games, the

contest which has won most popular favor is the Marathon race. This may have been useful in a Homeric age, but it is entirely out of place in our modern world. Many boys of high-school age at least have without doubt been injured during the last few years in training for, or participating in, "Marathon races."

The dualistic philosophy of the early Christian era extending down to the Middle Ages gave no opportunity for physical education or adequate care of health. So long as the body was considered evil, the enemy of the spirit, sanity was lacking and rational education was neglected.

With the revival of learning, consideration was given to physical education with other aspects of human culture. There were early efforts to express both in theory and practice, the idea of physical education as derived from the study of the classics and the more recent influence of the age of chivalry.

Vittorino da Feltra (1378-1446), considered the first Italian schoolmaster of the new era, introduced in his school at Mantua, dancing, riding, fencing, swimming, wrestling, running, jumping, and archery. He seems to have been much ahead of his time, as outside of the training of young noblemen in various parts of Europe, no similar school is recorded until Basedow opened the Philanthropinum at Dessau in 1774. In the meantime several educational reformers wrote in liberal-minded fashion about physical education.

Martin Luther recommended the knightly exercises of fencing and wrestling. Joachim Comerarius (1500-1574) published a brief dialogue of bodily exercise, believing that boys should be encouraged to run, jump, wrestle, fence, etc. Comenius (1592-1671) believed in education through the senses and was first to enumerate the principles which lie at the foundation of kindergarten philosophy. He thought that a half-hour of recreation should follow each hour of study. Montaigne (1533-1592) is often quoted: Health and strength are necessary—

for the soul will be oppressed if not assisted by the body.

Our very exercise and recreation, running, marching, etc., will be a good part of our study. . . . I should have the outward mien and behavior, and the disposition of his limbs formed at the same time with his mind.

It is not a soul; it is not a body we are training up; it is a man; and we

ought not to divide him into two parts and, as Plato says, we are not to fashion one without the other, but make them draw together like two horses harnessed to a coach.

John Locke (1632-1704) says:

Keep the body in strength and vigor so that it may be able to obey and execute the orders of the mind. . . .

A sound mind in a sound body is a short but full description of a happy state in this world. He that hath these hath little more to wish for and he that wants either of them would be but little the better for anything else.

Emile Rousseau (1712-78) says:

The body must needs be vigorous in order to obey the soul; a good servant ought to be robust. . . . The weaker the body, the more it commands, the stronger it is, the better it obeys. . . . In order to learn to think we must exercise our bodies which are the instruments of our intelligence.

Pestalozzi (1746-1827) attempted to devise a system of school gymnastics based upon the nature of the body, and tried to combine industrial as well as general bodily training with mental and moral education in his experiments for the amelioration of the common people.

The essence of elementary gymnastics [says Pestalozzi] consists in nothing else than a series of exercises of the joints, in which is learned, step by step, all that the child can learn with respect to the structure and movements of the body and its articulations.

In this form of explanation Pestalozzi was one of the first to formalize in theory the process of bodily development, to make it a mechanical method of subjective and artificial control, and to favor an anatomical (as distinguished from a functional) idea of physical education which is subject to serious question at the present time.

Guts Muths (1759-1839) who taught at the Schnepfenthal for over fifty years, defined gymnastics as a system of exercises having bodily perfection for their aim. Here again is a tendency expressed, to develop the body for its own sake and somewhat independently of its true relation to mind and soul.

F. J. Jahn (1778-1852) is known as the "father of German gymnastics." Jahn was an extreme patriot and his desire was to rebuild the bodies of the young Germans in order that they might withstand the French. Jahn used games to some extent, but later

devised a great variety of forms of apparatus whose use seemed designed to develop strength of body in the shortest possible time. Jahn performed a great service to military Germany, but in his work scant respect was paid to physiology and anatomy and to some of the psychologic needs in the education of the young.

Adolph Spiess, a little later in the early part of the nineteenth century, became the pioneer in the development of school gymnastics. He also as a musician adapted musical accompaniments to gymnastic movements. His material was systematically arranged, but it neglected some essential requirements of physical education.

P. H. Ling (1776-1839) led in the development of the Swedish gymnastics which resulted in the most precise system of movements and exercises which the world has known. This system was elaborated to meet the needs of human nature in what Ling and his followers considered to be "its fallen and dilapidated state." In their interpretation of physiological principles, which seems today lacking in many vital elements, gymnastic movements were elaborated to meet needs which were expressed as "military, pedagogical, medical, and aesthetic."

In several countries in Europe outside of Sweden, and in parts of the United States, Swedish gymnastics have gained as prominent a place in the schools as has the so-called German system or any other method. All the divisions of gymnastics according to Ling tend to bring about unity.

Pedagogical gymnastics develop the *minute endowment* to unity among the parts of the organism. . . . In military gymnastics the unity is sought between the body and the weapon in relation to the expression of antagonist. . . . By means of medical gymnastics, one seeks to restore unity between parts which has been lost through their abnormal conditions. . . . Through aesthetic gymnastics, the subject expresses the unity which exists between the mental and bodily being. . . . Therefore, all the principal divisions have a mutual interdependence, and gymnastics, in which no regard is paid for the unity which should exist in and among these parts, have no laws but are simply based on whim or fashion.

The Swedish system required a degree of exactness in movement beyond anything demanded by other methods, and the principles of activity as outlined by the Swedes are considered by many to be structural rather than functional in spirit, lacking in many of the

important qualities demanded by our present-day physiology and psychology.

The outdoor sports of England and her colonies represent more than any other national movement in physical education, the expression of the play instinct, and present in striking variety and range of recreative elements a great programme of games and sports which has been an essential factor in the development of a great world power, for a long time the foremost among the nations. The English sports have had a prominent place in the life and physical education of our own country.

In the progress of physical education in the United States, two distinctive influences have arisen in this country. Dio Lewis (1861) introduced rather widely to popular use free gymnastics performed with music, and exercises with dumb-bells, wands, and other forms of hand apparatus. Sargent, more recently, as a phase of his support of physical education, has elaborated the system of developing appliances by means of pulley-weights, in which, by means of graded weights, measured resistance is given to definitely localized muscular movements. The attention which just now is being given to play, games, and swimming, as well as the revival of folk and national dancing, represents additional features and indicates the wide range and confusing variety of the manifold elements related to physical education.

All of the various materials and influences enumerated, from Greek onward, have entered into the relatively brief development of physical education in this country, and are all at the present time in use, though fortunately not in any single institution, nor in collective effect upon a single pupil or group. According to the prominence of national, political, or personal influence in school or community, certain ideas obtain control for the time in this as in other aspects of education.

There is at present, therefore, throughout this cosmopolitan country great diversity of opinion with reference to controlling ideas in physical education and complete lack of agreement regarding material and methods of instruction. This is inevitable and probably salutary, as opportunity is thus given for free experimentation and for local adoption of ways and means for recognized aims.

It is apparent to many, however, that physical education, more

particularly in the public-school system of this country, has on the whole lacked the support of a well-organized body of thought which is in harmony with the best current educational theory. To many, again, it is evident further that the principles of physical education, even as formulated, have not kept pace with general educational progress.

Several reasons may help to explain this condition of affairs. Not until the last few years has there been a practical recognition of the broader social scope of education with the implied obligations to the physical and social, as well as the intellectual and moral needs of the pupil. Beyond this, it is but recently that modern psychology and physiology have proclaimed the scientific facts which have shown the more vital and intimate interdependence between the different aspects of life, which are called physical, intellectual, and moral.

Up to the present time general educators have given little attention to the study of physical education. Such study, when undertaken, has stopped with the external details of school management; has been superficial as a rule; and has failed to penetrate to the intrinsic and vital phases of the problem.

On the other hand, the great majority of the physical educators have been ignorant of the general principles and tendencies of education. They have been trained narrowly, to think of and deal with physical education much as a detached problem, and too largely, on the materialistic physical plane. This tendency to an unrelated specialization is not confined to physical education, but is perhaps aggravated here, inasmuch as a considerable part of the impetus in the development of this field has come through agencies outside of those directly educational. It has been unfortunate, also, in some respects at least, that so many of the teachers of physical education throughout the country have received their professional training in special normal schools, away from students in other departments of teaching, and outside the atmosphere of general education.

It is the business of physical educators, in co-operation with the agencies which should provide for hygienic care, to secure for the pupil, through a rational distribution of motor activities, certain health values represented by favorable posture, organic vigor, and other desirable biologic qualities. If necessary, these health qual-

ties must constitute the main goal in this field, but it is most desirable that physical education should occupy itself with a programme of activities for the young which would secure these physical aspects of health without fail, as by-products, as it were, while the pupil is being guided in the doing of things which will result in the acquirement of mental, moral, and social benefits. Health, then, in the narrower sense, becomes an essential means or condition in physical education to the accomplishment of certain exceedingly valuable results in the general education of the child.

It is unfortunate that the physical and muscular aspects of health occupy so large a part of the horizon of the physical educator.

The new asceticism must assert the value and duty of exercise, but it has only contempt for the ludicrous cult of muscle which is one of the follies of the age.

We must remember, what is so constantly forgotten, that vitality and muscularity are not one and the same thing.¹

Physical education is much more a matter of the nervous system than of the muscles. It should be considered more a qualitative than a quantitative affair.

Physical education is for the sake of mental and moral culture and not an end in itself. It is to make the intellect, feelings, and will more vigorous, sane, supple and resourceful. It should make for control and keep the body under and make it a servant and not a master. Practical ethics of body and soul is the core of all. The psychologizing of athleticism is now its crying need. The ordinary medical side is not enough. The history and psycho-physiology of military drill, dancing, the great national sports and games and their effects are needed.²

Physical education today, then, is too much occupied in:

a) Seeking certain postural and corrective results which are not after all satisfactorily obtained in class exercise by formal movements involving the consciousness of muscle and body by the pupil. These results, except as obtained in individual cases by remedial gymnastics, may be gained, in the main, as well or better through exercises which are more natural, spontaneous and enjoyable;

¹ Saleeby, *Health, Strength, and Happiness*, pp. 17, 101.

² G. S. Hall, *Proceedings of the National Education Association* (1908), p. 1015.

b) Training the body too much within itself, and without sufficient regard for the attitude of the mind and for the indirect effects of exercise upon disposition and personality;

c) Developing various forms of ability which are not, in identity, similarity, or analogy, closely enough related to the interests and activities of human life to justify the time and effort given to them.

Physical education has not yet an integral place in the educational theory and programme of the country. It has been given certain space and time, and often grudging recognition in response to the hygienic demands (usually the protests of the physicians) in the effort to counteract, or to compensate for, the unhealthful influences of school life.

Physical education has had, however, not nominally perhaps, and not always adequately, but in effect, a very logical place in the kindergarten. Its position in the curriculum of the school above the kindergarten has been more uncertain. The petition of the physical educator is very commonly for more time in the curriculum. There is suspicion in the minds of some that the proffered material of physical education has frequently not been of a character to rationally compel the recognition asked. When physical education presents a programme which is psychologically and physiologically sound, and therefore, pedagogically acceptable, it will find itself in organic relationship with education as a whole and to the other subjects or departments represented.

Physical education should provide, in instruction and supervision, for the desirable margin of motor activity which is not otherwise supplied in the school curriculum or in the life of the pupil outside of the school.

The main function of education, perhaps, is to train the human mechanism toward efficiency as an instrument of self-expression, with reference to the various opportunities and responsibilities of life, at the time and later. The child learns far more of permanent value through what he does—and this always means neuro-muscular action of some sort—than through what he sees or hears or perceives in any way directly with the five senses. In fact, perception of sensation depends on some degree of activity. Motor sensation is the great cornerstone in the foundation of human education. The experience of a Helen Keller demonstrates how much can be

accomplished in education without sight and hearing if the main avenues of sensation from movement are left open.

The psychologists maintain that action even is necessary to the complete consciousness of sensation.

The unity in the reference of the sensation comes in on the side of the act. . . . It is not likely there can be any well-defined consciousness of the respective sensations, as such, except as they become co-ordinated in single activities and are made to serve definite functions in the carrying out of the activity. . . .

Consciousness grows in definiteness of reference and content as activity becomes more and more complex. Every emotion presupposes a definite organization and co-ordination of previous activities. The so-called attitudes of powers of mind, are simply differentiations of consciousness with reference to the need of action. The mental attitudes of all mature minds are strictly co-ordinate with the complexity of activity of which they are capable.⁸

The psychology of movements performed on the gymnasium floor or in the playground involves the same principles and elements as those belonging to classroom, laboratory, and studio, and in a particular case the former may involve a richer content and more important result than the latter. If the motor training and experience of the child are complete or satisfactory, even from the broader psychological standpoint, then, so far as muscular activity and exercise can secure these results, the child, as a rule, will have favorable posture and physique; organic health and vigor; facility and efficiency in action; aptitude and power for the tasks which may reasonably be demanded during a life career.

The determination of the scope and content of this entire range of motor activities, must always be a provisional one in relation to the typical or individual child, subject to revision as circumstances may dictate. The determination of the margin of motor action which belongs to physical education will depend upon the answer given to the general problem, and upon the breadth and variety of motor training demanded by the "humanistic, scientific and industrial" aspects of the newer education. This margin will vary with the varying course of study in different schools and sections of the country. The more completely the rational and liberal school curriculum may provide even incidentally for the physical education

⁸ King, *Psychology of Child Development*.

needs of the pupil the better it will be for the child. Recent progress in education shows a marked increase in the larger motor elements adopted in the regular work of the school in connection with manual training, nature-study, school excursions, school festivals, and the like.

The physical education margin, in providing supplementary training, will naturally deal with the large, more primitive, and more fundamental forms of action. It should always strive to secure and maintain the basic "fundamental" power upon which the more "accessory" elements involved in the curriculum may safely rest. At times it should concern itself with the supports and buttresses of this superstructure in the attempt to preserve stability and equilibrium. This idea is better expressed in terms of function as it is related to the balancing of the programme of the pupil by providing for recreation, change of activity—keeping the center of gravity in the right place while all the time some of the most vital and larger values in education are industriously pursued by the teacher.

The subject-matter of physical education is found in play, games, dancing, swimming, outdoor sports, athletics, and gymnastics (reconstructed to satisfy educational needs). These headings are not mutually exclusive but are used to cover the range of activities.

The content of the physical education margin may seem less serious and dignified to some than the study of the humanities, science, or industry, but it may at any particular time, and in the long run, be as important as any or all of them, and much more so, oftentimes, for the individual. Further be it stated, that the more technical and specialized forms of ability in education depend very vitally for present and future well-being upon all that is logical and justified in physical education.

This proposed programme looks to the process of human evolution for general guidance concerning a part of the method to be pursued. Primitive men, our ancestors more or less remote, became strong and healthy; developed physical and moral powers through play in childhood and by doing very real things in hunting and fishing, in agriculture, in war, in industry, in commerce, in supplying human needs; but always in immediate unconsciousness of self, without understanding what went on in muscle and nerve. They were expressing ideas clamoring for utterance, or engaged in

accomplishing tasks with concrete and absorbing goals in actual or in mental view. Children and young people must do things today, not necessarily identified in type and purpose with those of primitive life, but in the same general spirit and manner if the method is to be effective and the results satisfactory.

Certain conditions seem necessary for rational exercise in physical education if the best results are to be obtained.

I. The activities of physical education should be carried on out of doors, whenever this may be made possible. The gymnasium should be considered an emergency-space, valuable to be sure, when required by inclement weather and under other circumstances; but it should never interfere with possible use of nature's infinitely better playroom out of doors.

II. The exercises should be natural in type, satisfying by their execution the play instinct and the fundamental powers and faculties as they develop, with due regard to the ancestral habits of activity and to the future practical needs of the individual.

Not every possible action of voluntary muscles and nerves is desirable in education by any means, even though this action may strengthen muscle and nerve structure, develop exact control and enhanced power of co-ordination, and bring results which seem to fulfil the conditions of improvement. We are learning by practical experience, and through the teachings of the newer psychology which aims to interpret this experience, that true culture of the highest type depends upon gaining faculty and power through the doing of things which correspond in type and quality, in the main motives and reactions, to the worthy deeds of the race and more particularly to the actual work and conduct of humanity today.

Education, whether in physical training or other branches, should secure to the pupil, beyond mere bread-and-butter needs, the ability to meet the wider opportunities and the possible emergencies in life; but the performance of tasks requiring primarily subjective control of action, and aimed too directly (and by a short cut) at benefit to bodily health or mental faculty, may not only fail to accomplish its direct purpose, but also fall short of the intended indirect benefit to other faculties and powers. There are many "fancy stunts," as well as exact and intricate performances in various branches of education which lack rational sanction from modern educational

theory. In the past they have been considered extremely valuable, not only because they were showy, but for drill and discipline. They are dropping very rapidly out of use in relation to reading, spelling, writing, manual training, and most of the departments of teaching.

Formal gymnastics, free-hand movements, for the most part, and much of the apparatus work of the gymnasium, belong to the category of artificial "stunts," mechanical movements; lacking the purpose, mental content, and objective which are essential to sensible educational performances. Most of the free-hand exercises, particularly, are mechanically rigid, jerky, and awkward, as compared with natural, useful movements of the body. They are uninteresting and distasteful to most boys and girls except in the early elementary grades, when they are considered by the physical educator even relatively less important.

Formal gymnastics in physical education correspond to drugs in medical practice. The movement in medical treatment even is away from the use of drugs. In a similar way progress in physical education must be away from all formal, artificial kinds of movement.

It is important that a reasonable amount of physical education should be required of every pupil and student in school and college. It is correlatively important that this training should enlist the interest and enthusiasm of each pupil, not primarily in keeping healthy, but in the doing of things, having intrinsic objective interest, whose performance will insure good health. Much of the required physical education at present cultivates a dislike for healthful exercise. This is inexpressibly unfortunate, and forms an indictment against such instruction in as much as one of the most important purposes of physical education should be to cultivate the liking for rational, pleasurable, healthful exercise.

III. In physical education, as in other branches, the pupils in practice should either: (a) express an idea, feeling, or emotion, which seems worth expressing, e. g., in dancing, pantomime, or other form of dramatic representation, or (b) there should be some definite objective aim or effect to be attained as the result of the muscular effort performed, as in maintenance of squad formation in marching, hitting a ball, throwing a ball into a basket, swimming to a given point, out-running a competitor, or any one of the indefinite number of things to do in games.

Given a rational observance of sanitary and hygienic practice in the schoolroom and a fair amount of time for play and recreation in fundamental motor training, and all the desirable qualities of health in structure and function of the body will accrue to the child without the artificial movements already referred to, except in individual cases (which will be fewer as education becomes more hygienic) where the most exact and accurately applied movements should be used like medicine to correct individual weaknesses and tendencies.

IV. The activities in physical education should be correlated whenever feasible with the subjects and activities with which the child is occupied elsewhere in the school or outside. Games vary with the season of the year, with climate and weather changes. There are many opportunities in connection with study of literature, history, nature-study, art, industry, and other subjects, to employ dances and games which have definite relation to the subjects in hand and give the child a most valuable opportunity to express himself more completely in relation to the interest which occupies his attention. It seems important for many reasons that the more accessory, specialized, symbolic modes of expression in education should be reinforced and broadened by the larger and vital forms of action which physical education may, and should, provide.

Folk dances may be correlated with seasonal interests and festivals, e. g., harvest time, Christmas celebration, patriotic anniversaries, May Day, etc. The development of the festival idea in relation to school work seems to have many valuable possibilities if the festivals can be utilized in a way to improve the desired general resultant of school work and not interfere with the attainment of recognized ends. The school festival as a rule, wins the enthusiasm of pupils. It affords opportunity for genuine correlation of literature, history, music, fine and industrial arts, and physical education; if physical education is ready to provide live material in dancing, marching, pantomime, and games.

To utilize the opportunities for correlation it is necessary that the teacher or supervisor of physical education be acquainted with the curriculum and the work of the school as a whole.

V. Gymnastic technique (as distinguished from marching, dancing, games, athletics), when used under the head of formal gym-

nastics or other titles, should consist in the practice of movements involved in actual and natural kinds of performance, or closely related in form to such movements, for the purpose of acquiring greater strength and skill, so that the complete action or original performance may be more effectively executed. Such technical practice is ordinarily better performed through individual exercise, as a musician practices on the instrument, or a singer practices with the voice. It is possible, however, to practice advantageously some of the large movements involved in dancing and games in class instruction. Children in the elementary grades even may devise movements and construct gymnastic drills which will satisfy the psychologic demands of such drills, and incidentally give desirable physiological results; e. g., a third-grade class constructed a gymnastic drill which was designed to improve ability in rope-climbing. This drill naturally lacked the mechanical precision of Swedish gymnastics but it possessed enough value of another kind to more than make up for what was lost.

VI. The pupil, while intent upon some external result in individual or co-operative effort, should be unconscious of his own body or of the purpose of exercise to benefit his body or health.

Self-consciousness, self-analysis of the mind or body in education, except as incidentally required in the direct effort to attain an external end in a more effective way, must always detract from the best results, whether measured in terms of bodily health, or skill in action; the actual products of effort expended, or the indirect effects of education.

VII. Mechanical uniformity and precision of movement, in a group or class of children, can logically be demanded, not primarily or simply because the teacher asks for, or orders it, or because it appears better to the spectator, but only when the situation, expressed as an external problem, requires it. Evolutions in marching, and sometimes dancing, necessitate precise uniformity in movement among smaller or larger numbers of actors, and these evolutions must be changed by word of command of teacher, officer, or leader. In general, however, it is most desirable that mechanical uniformity should not be demanded, but that, with the observance of certain general principles of action, the pupil should be left free to express individuality in action. Uniformity and precision in gymnastics,

persisting from the old military régime in physical education, particularly, have come to be fetishes, and in the effort to secure them, important values have often been neglected.

It is significant and illogical that the gymnasium is practically the only place in school where uniformity in action is expected of all pupils in a grade. In the future, gymnastic technique must be reconstructed in relation to real conduct in life, to meet psychic and functional needs rather than the mechanical anatomic standard of precision which prevails so largely at present.

VIII. Physical education should be supervised and directed with reference to the beneficial social and moral results which may be gained by the right performance, in play, games, and athletics, of the large fundamental types of human action.

It is because the brain is developed, while the muscles are allowed to grow flabby and atrophied, that the deplored chasm between knowing and doing is so often fatal to the practical effectiveness of mental and moral culture. . . . The trouble is that few realize what physical vigor is in man or woman, or how dangerously near weakness often is to wickedness, how impossible healthful energy of will is without strong muscles which are its organ, or how endurance and self-control, no less than great achievement, depend on muscle habits.⁴

Spinoza makes the pregnant remark that we do not know what Body is capable of. We may go a step farther and, following Aristotle, declare that we shall never know, till Body finds its true function as instrument of fully developed soul. For materialism consists, not in frankest recognition of matter, but in the assignment to it of a spurious supremacy or independence. There can be no materialism in utmost emphasis upon physical education, so long as "Body for the sake of Soul" is as it was with Plato, the presiding principle of educational action.⁵

Very little profitable instruction in theoretical ethics can be given in the elementary or even in the high school. Children and youth get most of their moral instruction in relation to action, and many important ethical principles may be instilled in connection with the large primitive types of conduct involved in personal health problems and in games and sports. The playground, gymnasium, and athletic field afford the best opportunities for the learning of moral lessons,

⁴ G. Stanley Hall, "Moral Education and Will-Training," *Pedagogical Seminary*, Vol. II, 1892.

⁵ MacCunn, *The Making of Character*, p. 59.

sometimes even by college students. The president of a great university said a few years ago, "The instructor of physical education has a more powerful influence upon the morale of students than the teacher of any other subject." It is most important then (1) that this teacher should have an adequate appreciation of the moral influence that should be exerted, and (2) have personality, character, and tact to exert such influence wisely and effectively.

IX. In the fifth or sixth elementary (or the first or second grammar) grades when some of the girls enter the pre-adolescent period of greatly accelerated bodily growth, boys and girls should have the more vigorous games and exercises in separate classes, and from that time onward in their physical education the forms of exercise should be adapted to sex differences as well as to advancing age and personal needs.

X. While in physical education certain psychic, social, and ethical results should be directly sought, the forms of exercise should always be arranged and controlled so that favorable physiologic values may be obtained. In other words, physical education should always be hygienic in the highest degree. More than this, physical education must not only be hygienic for the typical pupil of any particular age, but it must be safe and hygienic for each individual pupil. This can only be accomplished on the basis of knowledge of the health condition of each pupil. Many students, both boys and girls, in our schools have been injured, and are being injured, by participation in games and exercises which are too severe for them, with their individual health weaknesses and limitations. The health inspection, advocated earlier in this report, provides an intelligent basis for the individual adjustment of exercise.

Some of the faults of the present methods of physical education are indicated by implication under the previous headings.

Brief reference is now made to certain common and very practical errors in present physical education teaching which have a direct bearing on health—

a) It is an error to teach pupils to "toe-out" in the gymnasium or on the drill ground, in standing, marching, running, and dancing. Turning out the toes tends to weaken the foot—to produce "flat foot." The "straight-foot" position with the feet parallel (not

necessarily together), or with toes only slightly turned out, is the best position.

b) There is too much stamping in gymnastic practice. The ball and heel of the foot should never strike the floor at the same instant. If this occurs the foot ligaments are often strained and this may weaken the arch of the foot. In dancing, running, jumping, and in stepping or changing position in any way, the ball of the foot should always strike the floor first. Jarring of the body should be reduced to a minimum. There is too much emphasis in gymnastics upon downward movements with arms, legs, and body, and not enough effort to lift up and hold up the entire body against the force of gravity.

c) No gymnastic movements taken when the pupil is standing should require backward bending of the spine except as this occurs unconsciously and to a slight degree when the very laudable effort is made to lift or hold the chest up and forward.

d) There is a frequent tendency to teach girls and young women gymnastics, with and without apparatus, which are too strenuous and heavy for them. Girls should be trained in the gymnasium how to land lightly on the toes; how to come down a rope from a moderate height; how to get off a street car properly; how to swim if there is opportunity for such instruction; but jumping, and swinging by the arms, should be controlled and limited carefully for adolescent girls and young women. The subject-matter of physical education needs revision in relation to the requirements of girls and women.

e) Too often the teacher of physical education, intent upon the conduct of class or group as a whole, is not sufficiently aware of the individual, and as a result one or more pupils may exercise beyond the point of reasonable fatigue, or in some way prejudicial to personal well-being.

SOME FORMS OF EXERCISE IN PHYSICAL EDUCATION

The fundamental impulse or motive to be considered in physical education is play. Those students who study play most carefully give it most serious consideration with reference to its possibilities in the life and education of the child. The more strenuous and intellectual modern life becomes, the more important it appears to be

to cultivate the spirit and to provide the chance to play for child and adult. The theories of play are not altogether in agreement, but whether one believes in the Spencer-Schiller theory that play is due to the effort of surplus energy to express itself, or in imitation or recapitulation theories, or in the Groos theory of instinct, all may agree that the young of animals exhibit the play instinct and that the human child has his full share of it.

The distinction between play and work for the child is not very definite for some wise people believe that the more like play the child makes his serious tasks, the more benefit he will derive from them. So in physical education it is most desirable that the child should have opportunity and guidance for the doing of those large activities which will keep him vigorous and robust, which will develop alertness, self-control, with the other desirable qualities, and all in the spirit of joyous, free, exultant movement.

It may be justly claimed that the child gains more educationally, in the first eight or ten years of his life and lays a surer foundation for the mental and physical health of after life through vigorous, unrestricted physical activity than through any other factor whatsoever. By this I mean spontaneous play under favorable conditions, with accompanying fresh air, sunshine and good food, supplemented and enriched by gymnastics and athletics, including swimming. I do not mean that nervously exhausting and deadening drill known as the Swedish gymnastics, which, in the name of educational gymnastics, adds fatigue to fatigue by taking the initiative away from the child and forcing him to pay constant and close attention to the orders of the teacher, that he may execute with precision entirely uninteresting and conventional movements.⁶

The plays and games of childhood present ever-varying conditions, constituting both mental and physical problems of the highest educational value. The child is habituated to make rapid judgments in the face of changing conditions. He must be constantly on the alert, must perceive conditions as they are, must immediately adapt his own action to their quick-changing relations, and, as a result, he gains the perfect control of his body which serves him throughout life. As teachers, we must recognize that the judgments upon which all these active movements are based are intellectual operations. In play the child is the unit of force; he initiates his own conditions. His limitations are self-imposed. His self-control lies in execution

⁶G. W. Fitz, "Hygiene of Instruction," *Proceedings of the National Education Association* (1898).

rather than in inhibition. He is concerned with self-expression rather than with self-repression. Play thus relates itself to the truest conception of education, the development of the power of the individual to act as a self-directed unit in the community.⁷

In the large social problem of providing for play, the playground becomes the primary and essential factor in making play reasonably possible. The gymnasium, schoolroom, nursery, or other inclosed space should be considered an adjunct to the playground. As the little child gets older the play impulse expresses itself more satisfactorily in games; simple at first, and later more highly organized. From the almost unlimited range of game material at present available, certain lists are here suggested as adaptable to the different grades in school, and to boys and girls when games and exercises should be adapted to their separate needs.

Two general classes of games are used very largely on the playground or in the gymnasium: (a) the "dramatic game" which is characterized by the expression in movement of the child's ideas, without reference to any objective end: e. g., pantomime, dancing, and singing games; (b) the game of skill in which the effort to accomplish some definite external result involves skilled action with varying degrees of physical strength and endurance: e. g., ball games and those requiring forms of marksmanship.

While many games require only the independent action of the individual player, there are a large number, on the other hand, which depend for success upon co-operative group action, upon "team work." Each type of games has its own peculiar advantages and is adapted to certain ages and classes of children.

The dramatic game is most acceptable and useful to children in the kindergarten and the first two elementary grades.

The games which prominently involve individual power and competition are best suited to children from eight to twelve years of age. The group and co-operative elements in games are valuable features for pupils in the later grammar grades and high school, and also, of course, for college students. During the period of adolescence the dramatic and individual elements are not eliminated but they lose their relative prominence as the social and co-operative qualities become more pronounced.

⁷"Play as a Factor in Development," *American Physical Education Review*, December, 1897.

Many games may be played with enthusiasm in all of the first five or six elementary grades, but the game under the same name will develop in complexity and difficulty as the children grow older and gain interest in increasing ability and technical skill.

GAMES SUGGESTED FOR SCHOOL USE

Grade I

Running games—

- Drop the Handkerchief
- Cat and Mouse
- "Come Follow Me"
- Cat and Mice
- Garden Scamp
- "I Saw"
- The Boiler Burst
- Follow the Leader
- Claps

Dramatic games (constructed by class), as—

- Train games
- Fire-engine games
- Fairy game
- Squirrel game, etc.

Singing Games, as—

- Swinging Song—A. L. Stevenson
- Folk Games and Dances—C. Crawford
- Swedish Song Plays—Bolin
- Singing Games—Eleanor Willard

GRADE II

- Drop the Handkerchief
- Cat and Mouse
- Cat and Mice
- "Come Follow Me"
- "Have You Seen My Sheep?"
- Garden Scamp
- "I Saw"
- The Boiler Burst
- Follow the Leader
- Claps
- Black Man
- Single Relay Races—simple form—individual against individual—score by points
- Folk games, as "Shoemaker"

GRADE III

Drop the Handkerchief
Cat and Mouse
Herr Slap Jack
"Have You Seen My Sheep?"
French Blind Man's Buff
Blind Man's Buff with wand
Steps
Sheepfold
The Boiler Burst
Wolf and Shepherdess (or Fox and Geese)
Follow the Leader
Claps
Tommy Tiddler's Ground (Kingsland)
Stealing Sticks
Black Man
Single Relays

GRADE IV

Cat and Mouse
Herr Slap Jack
"Have You Seen My Sheep?"
French Blind Man's Buff
Blind Man's Buff with wand
Steps
Bull in the Ring
Sheepfold
The Boiler Burst
House Hiring
Wolf and Shepherdess (or Fox and Geese)
Follow the Leader
Claps
Tommy Tiddler's Ground (Kingsland)
Stealing Sticks
Tame Fox
Hill Drill (or Pom-pom, Pull away)
Bound Hands
Black Man
Circle Tag
Three Deep
Relays (use of obstacles)

GRADE V

Cat and Mouse
 Herr Slap Jack
 "Have You Seen My Sheep?"
 French Blind Man's Buff
 Blind Man's Buff with wand
 Steps
 Bull in the Ring
 Sheepfold
 The Boiler Burst
 House Hiring
 Wolf and Shepherdess (or Fox and Geese)
 Follow the Leader
 Claps
 Tommy Tiddler's Ground (Kingsland)
 Stealing Sticks
 Tame Fox
 Hill Drill (or Pom-pom, Pull away)
 Bound Hands
 Black Man
 Line Tag
 Circle Tag
 Three Deep
 Relays { Single } with obstacles
 Double
 "All Up"
 Duck on the Rock

DEVELOPMENT OF THE BALL GAME (THROUGH FIRST FIVE GRADES)

I. *Rolling Ball Games*

- a) Children roll ball from one to another.
- b) Roll with aim. Teacher in center of circle rolls ball to each child who then returns it.
- c) French ball—one child in center of circle. Children attempt to roll ball from one to another across circle without having it caught by child in center, for if he catches it the player who touched it last must take the center place.

II. *Bouncing Ball Games*

- a) Individual child practices bouncing ball and catching it.
- b) Teacher in center bounces ball to each child who returns it in the same way.

- c) Individual child practices throwing ball up and catching it on bounce.
- d) One child in center of circle calls name of some other child and tosses ball in air. Child called must catch ball on one bounce.
- e) Tossing ball up and catching without bounce.
- f) (d) may be played without letting ball bounce.
- g) Battle ball.

III. *Throwing or Passing Ball*

- a) Teacher in center throws ball to each child who throws to her.
- b) Touch ball may be played passing ball (instead of rolling).
- c) Teacher (or Leader).
- d) Dodge ball (moving goal).
- e) Zigzag.
- f) Battle ball (throwing ball).
- g) Puss ball.
- h) Medicine ball.
- i) Stride ball.
- j) Toss ball (overhead), relay.
- k) Newcomb.
- l) German bat ball.

ATHLETICS AND GAMES (FIFTH, SIXTH, AND SEVENTH GRADES)

Games in which the individual is alone concerned

Boys	Girls
Swimming	Swimming
Skating—ice and roller	Skating—ice and roller
Jumping	Running
Running	Archery
Fungos—batting flies	Battledoor and shuttlecock
Archery	Diabolo
Battledoor and shuttlecock	Rowing
Diabolo	Canoeing
Rowing	Tether ball
Canoeing	
Tether ball	

Group Games and Contests; in which the individual is most prominent

Boys	Girls
<i>Games of Tag</i>	<i>Games of Tag</i>
1. Cross tag	1. Cross tag
2. Pull away	2. Pull away
3. Hang	3. Hang
4. Prisoner's base, etc.	4. Prisoner's base, etc.

Boys	Girls
<i>Relay Races</i>	<i>Relay Races</i>
Running	Running
Indian clubs	Indian clubs
Wrestling	
<i>Ball Games</i>	<i>Ball Games</i>
Screen ball	Center ball
Curtain ball	Curtain ball
Center ball	Dodge ball
Dodge ball	Stride ball
Stride ball	Zigzag ball, etc.
Zigzag ball, etc.	
Circle rope jumping	Circle rope jumping
Tennis	Tennis
Leapfrog	Leapfrog
Handball	Handball
Giant stride	Giant stride
Croquet	Croquet
Cross country <i>walks</i>	Cross country <i>walks</i>
Gardening, Nature-study	Gardening, Nature-study
Track and field events	

Events in which *Team Work* gradually becomes the essential feature

Boys	Girls
Baseball	Indoor baseball
Basket-ball	Basket-ball
Field hockey	Field hockey
Socker football	Cricket
Cricket	

ATHLETICS AND GAMES

High School

(In addition to preceding)

Boys	Girls
Baseball	Indoor baseball
Basket-ball	Basket-ball (girls' rules)
Field hockey	Field hockey
Ice hockey	Cricket
Cricket	Handball
LaCrosse	Swimming and diving
Socker football	50-yard dash
Rugby football	Hurdles
American football	Canoeing and rowing
Handball	Tennis
Swimming and diving	Billiards

Boys	Girls
Boxing	Golf
Track and field athletics	Bowling
Squash	
Canoeing and rowing	
Tennis	
Billiards	
Golf	
Bowling	

Basket-ball under proper restrictions is an admirable winter indoor game for both boys and girls. The rules of the game should be modified for the girls, as is the case in some schools. Girls should be protected by the rules from too violent jolting and jostling of the body and from covering in play more than one-third of the regulation floor area. For boys the rules of the Amateur Athletic Union should be used as these provide better than the present inter-collegiate rules, for a limitation of undesirable features of play.

FOOTBALL

The value of football in the training of high-school boys, especially those of the large centers of population, is well recognized. No other game now played brings out so well the qualities of manliness, courage, daring; the willingness to sacrifice and subordinate self for the good of the whole; alertness; the ability to co-operate with others; quickness of judgment, and determination. Yet the sacrifice of twenty-nine lives and numerous serious accidents in one season all testify to the necessity of a radical reform, if the game is still to be played by the American boy.

It is comparatively easy to point out what ends or results are to be sought in the reorganization of the game, but exceedingly difficult to formulate the specific rules that will bring about the desired effects. Change must be made in the manner in which the game is supervised as well as in the actual playing rules.

Examples

1. The physical director of a prominent preparatory school stated, when between halves it was suggested that one of his "backs" was "all in," that he had given him two ounces of whiskey.

2. The coach of a prominent military academy is said to run what might be called a book-making establishment in which he urges his players to bet on the games.

3. One boy died of strychnine poisoning as a result of a hypodermic injection between halves (reported in newspaper).

Certain changes in football are evidently desirable while others have been suggested.

1. The rules provide for 35-minute halves which may be shortened by agreement between the two captains. Rarely is the full length of halves played, yet it would be better to put the maximum length at 15 or 20 minutes. After this length of time it becomes a matter of endurance and brute strength rather than skill.

2. Some regulation is necessary which will require the removal of a player who is manifestly in no condition to play. Not infrequently a player with slight concussion of the brain is allowed to continue in play. Possibly a rule necessitating the removal of a player, who asked or required time to be taken out for him, would meet this need. It is usually the player who has been repeatedly injured that at last receives the "fatal blow" (commonly reported in papers).

3. Modification of rules (now under discussion) so as to (a) protect the player better from injury; (b) do away with mass plays; (c) make game more open and provide for more free play.

It is most desirable that rules of play should be so devised that all the range of valuable qualities would be increased to the maximum while the elements of danger should be reduced to a minimum, if they cannot be eliminated.

TRACK AND FIELD ATHLETICS FOR HIGH SCHOOL BOYS

Track events of college athletics should be carefully controlled. Many high-school boys are injured for months, years, or for life by taking part in endurance races. There is no possible benefit from the long races to compensate for the harm that may result. High-school boys should not take part in races longer than 100 or 120 yards.

Hammer-throwing contest and tug of war should not be allowed. In shot-putting, the weight of shot should be limited to 8 or 12 pounds. Field athletics are suitable for boys, such as pole-vault, and long and high jumping on soft ground.

ATHLETICS FOR GIRLS

The typical outdoor athletic contests are not suitable for girls. Running races above 75 yards in length are distinctly objectionable.

Jumping should be very carefully controlled and should generally be restricted for adolescent girls. The developing reproductive organs, at this age, are easily subject to displacement. Many girls and young women have been seriously and permanently injured, in ways entirely avoidable, by participation in exercises too violent and taxing. Exercises for girls and women should be intelligently selected and adapted to their peculiar conditions and needs. With proper regulations, however, group games and contests are exceedingly valuable for girls.

Women, certainly as much as men, need to learn through practical experience the rules of fair play, generous treatment of rivals and opponents, merging of self in co-operative effort, concentration of power, and the bending of all energies toward an impersonal objective goal. A woman of direct experience and keen discernment has stated suggestive opinions regarding this phase of physical education in the following words:

There is no training which girls so much need as that which develops a sense of honor and loyalty to each other, and games will do more to really make these living qualities than the ethical systems taught in a college curriculum. It takes the finest kind of courage to be fair, to be honest, and to be loyal, and these are absolutely essential in good team work.

We may think that little vanities and jealousies and little unkind words or somewhat exaggerated statements have little harm in themselves; that bragging and snobbishness are perhaps pardonable under some conditions. Games try out these qualities and they appear in their exact proportion and in all their ugliness, devoid of the graces in which they are so often half hidden. A game is a well-nigh perfect democracy. Nothing is so good for the girl as to find that money, clothes, family, prestige, or "pull" are as nothing—that they do not help her to play good ball or make a team. She stands or falls absolutely by what she is and can do, and realizes that the game makes all equal, and that she may have to shake hands with a despised social rival on the field.

Some women are abnormally sensitive and introspective or morbid and live too much on the subjective side of life. The various ethical and religious cults which appeal primarily to the subjective self appeal largely to women. Sports are primarily objective, they afford no opportunity for analysis of feeling or consciousness of the process. The thought is upon the things to be done and not upon the doer. Every institution which provides opportunity for women's games is erecting a barrier against nervousness, morbidity and too much introspection.

The qualities which games develop are not essentially masculine, they are but human qualities needed for human fellowship, and I have yet to see a group of girls made masculine by holding these ideals before them, and where the spirit of the training is that which I have been trying to portray. I do not mean to say, of course, that every individual trait can be strengthened, every defect removed by game work, or that games alone can do this; but I do mean to say that organized sports for women, when put on a proper basis and under intelligent directors, will go a longer way toward training the faculties and moral instincts than many of the courses of instruction which are given the credit for doing this.⁸

The management of group athletics for high-school girls is rendered difficult by the fact that the girl should not take part in a vigorous game during the menstrual period. At just this time, not infrequently, her participation is needed as a member of a team. To guard against such a difficulty it is important to have several substitutes properly trained, or if this provision cannot be made, the game, however important, should be delayed rather than to allow any girl to run the risk of harm. The above and other reasons support the proposition that interschool or interinstitution athletic contests for girls are not as a rule advisable. If allowed under exceptional conditions they should be supervised with great care. Interclass games within the school can be more safely administered.

Originality and ingenuity in adaptation of games for high-school and college girls will bring about great improvement in this field of physical education.

In one eastern college for women, by the construction of implements of suitable weight, enjoyable and beneficial contests have been devised: discus throwing (with 4-pound discus); stilt race—20 yards; torch race—20 yards; javelin throwing; hurdle race—30 yards.

SWIMMING

Swimming is a valuable form of exercise for boys and girls and an accomplishment attended with many beneficial results, not only in strength and grace of body, but also in self-control and confidence in one's ability to do things in unaccustomed surroundings. In connection with the ability to swim, it is most advantageous that

⁸ Kellor, *Ethical Value of Games for Women*.

every boy or girl, at least of high-school age, should be taught how to assist a disabled person in the water, and also to resuscitate a drowning person. Such training has very genuine mental and moral value and through it the emphasis upon the principle of mutual helpfulness exemplifies the idea of social interest which it is important that the young adolescent should get at an early stage. Swimming is a valuable feature in physical education. Recently a regulation has been put into effect in Boston requiring that all high-school girls as well as boys shall learn to swim.

DANCING

Dancing is considered by some authorities the best of all forms of exercise. A prominent nerve specialist has recently stated his belief that dancing is the most perfect of all exercises, particularly because of its beneficial effect upon the nervous system. It has come into prominence within the last few years through the revival of folk and national dancing in this country and Europe.

In the wealth of dance forms coming from many nations, and because the dance is related to so many different interests and kinds of expression, there are almost unlimited possibilities in the adaptation of dances to children of different ages. It is desirable that in the education of boys and girls dancing should not be solely a pleasurable form of movement, though this would often be worth while in itself, but when the dance is used as a form of expression of worthy ideas and feelings, through the correlation of art, music, history, and literature with the dance, its indirect value is widely extended without its hygienic and recreative benefits being in any way lost.

Through the selection and adaptation of types of dancing to the different stages of development and mental interest of children and youth, dancing may become a very prominent factor in the physical education of the young.

MARCHING

Marching of the traditional military type has been much used in the gymnasium. It is an excellent form of drill in precise movement, whose utility finds application in the orderly movement of pupils through school corridors and transit from room to room, and in the very practical and important fire drill. It has other useful

possibilities which have not yet been much developed. In evolutions and formations, more flexible and less rigid than the soldier type, much variety and interest may be added to these squad and class evolutions. The arrangement of geometric and art figures, of different designs, suggested in flag formations and the like, aided by the color effects of special costume, will indicate some of the modifications which may be suggested.

Physical education should utilize exercises which are natural, interesting, and enjoyable, and which, in unconscious fashion, accomplish the desired ends of this fundamental motor training.

CONCLUSIONS

I. That these different aspects of health care in education are vitally related to each other.

II. That the conditions affecting the child are so arranged that the responsibility for the health care of the pupil must be divided with varying distribution of duties between the following: parent, family physician, teacher, principal, school physician (sometimes school nurse), and teacher of physical education.

III. That there should be sympathetic and close co-operation between home and school forces for the conservation and improvement of the child's health.

IV. That all of the school officials, beginning with the teacher and principal or superintendent, must meet his or her full share of responsibility in relation to the health of pupils, if this work is to be well done.

V. That the desirable balance and unity of the five phases of school supervision and teaching which affect the pupils' health renders necessary beyond the service of teacher or principal a co-ordination of functions which should be centered in a supervisor of health or hygiene in the schools.

VI. That each state should have a supervisor of school hygiene; and each city of sufficient size, and each county in the rural districts, should have a local supervisor of school hygiene.

VII. That such a supervisor should have a broad and thorough general and technical training to perform his duties successfully.

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CONSTITUTION

(Revision proposed by the Executive Committee)

ART. I. *Name.*—The name of this Society shall be "National Society for the Study of Education."

ART. II. *Object.*—Its purpose is to carry on the investigation and to promote the discussion of educational problems.

ART. III. *Membership.*—Sec. 1. There shall be three classes of members, active, associate, and honorary.

Sec. 2. Any person who is desirous of promoting the purposes of this Society is eligible to active membership.

Sec. 3. Active members shall be entitled to hold office, to vote, and to participate in discussion.

Sec. 4. Associate members shall receive the publications of the Society and may attend its meetings, but shall not be entitled to hold office, to vote, nor to take part in discussion.

Sec. 5. Honorary members shall be entitled to all the privileges of active members, with the exception of voting and holding office, and shall be exempt from the payment of dues.

A person may be elected to honorary membership by vote of the Society on nomination of the Executive Committee.

Sec. 6. The names of the active and honorary members shall be printed in the *Yearbook*.

Sec. 7. The annual dues for active members shall be \$3.00, and for associate members \$1.00.

ART. IV. *Officers and Committees.*—Sec. 1. The officers of this Society shall be a president, a vice-president, a secretary-treasurer, an executive committee, and a board of trustees.

Sec. 2. The Executive Committee shall consist of the president and four other members of the Society.

Sec. 3. The president and vice-president and secretary-treasurer shall serve for a term of one year. The other members of the Executive Committee shall serve for four years, one to be elected by the Society each year.

Sec. 4. The Executive Committee shall have general charge of the work of the Society, shall appoint the secretary-treasurer, and may, at its discretion, appoint an editor of the *Yearbook*.

Sec. 5. The Board of Trustees shall be elected by the Society for a term of three years, one to be elected each year.

The Board of Trustees shall be the custodian of the property of the Society, shall have power to make contracts, and shall audit all accounts of the Society and make an annual financial report.

Sec. 6. The method of electing officers shall be determined by the society.

ART. V. *Publications*.—The Society shall publish *The Yearbook of the National Society for the Study of Education*, and such supplements as the Executive Committee may provide for.

ART. VI. *Meetings*.—The Society shall hold its annual meeting at the time and place of the meeting of the Department of Superintendence of the National Education Association. Other meetings may be held when authorized by the Society or by the Executive Committee.

ART. VII. *Amendments*.—This Constitution may be amended at any annual meeting by a vote of two-thirds of voting members present.

N.S.S.E. 9TH YR BK. PART I

BOSTON UNIVERSITY



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